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Federal Energy Regulatory Commission
Office of Energy Projects
Washington, DC 20426

Atlantic Coast Pipeline and Supply Header Project

Final Environmental Impact Statement

Volume I

Atlantic Coast Pipeline, LLC
Dominion Energy Transmission, Inc.

Docket Nos. CP15-554-000, CP15-554-001, CP15-555-000, and CP15-556-000
FERC/EIS-0274F

Cooperating Agencies:

U.S. Department of Agriculture – Forest Service

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

West Virginia Department of Environmental Protection

West Virginia Division of Natural Resources

July 2017

3.6.1.3 ACP Compressor Station 2

Atlantic considered two sites for Compressor Station 2 in Buckingham County, Virginia; the currently proposed site and an alternative site located 1.9 miles to the southwest of the proposed site near the intersection of Midland Road and the existing Transco pipeline system. We received several comments that the operation of Compressor Station 2 would degrade air quality and impact residence around the proposed facility, and that an alternate site should be considered. We also received comments that the proposed location of Compressor Station 2 would affect the Norwood – Wingina and Warminster Historic Districts and the Yogaville Ashram. Thus, we evaluated the Midland Road site as a possible alternative. Figure 3.6.1-1 depicts the location of the proposed and alternate sites. A comparison of the environmental data on each site is provided in table 3.6.1-1.

TABLE 3.6.1-1

Comparison of Proposed Site and Midland Road Alternative Site for Compressor Station 2

Features	Unit	Proposed Site	Midland Road Site Alternative
Permanent easement	acres	12.9	13.1
Temporary construction workspace	acres	56.0	55.8
Additional miles of AP-1 mainline required	miles	0.0	1.1
Conservation easements	acres	0.0	0.0
Forested lands – Permanent	acres	12.8	10.6
Forested lands – Temporary	acres	36.1	38.8
Wetlands (NWI) – Permanent	acres	0.0	0.0
Wetlands (NWI) – Temporary	acres	0.0	0.0
Intermittent waterbodies	number	1	0
Perennial waterbodies	number	0	0
Prime Farmland – Permanent	acres	11.5	3.6
Prime Farmland – Temporary	acres	26.7	30.1
Noise Sensitive Areas (NSA) within 0.5 mile	number	9	10

The environmental impacts between the proposed site and the Midland Road Alternate site are similar; however, the alternative site would require additional pipeline and would increase the construction footprint of ACP. Further, our analysis in sections 4.9.9.1 and 4.11.1.3 concludes that operation of the compressor stations would not cause or contribute to a violation of the federal air quality standards; therefore, we do not believe health would be adversely affected or that the alternative site would be necessary for reasons of air quality or public health. Also, the Norwood – Wingina and Warminster Historic Districts are 4.5 and 5.9 miles from the proposed compressor station site, respectively, and the Yogaville Ashram is over 4.5 miles from the site. Therefore, these areas would not be affected by construction or operation of the facility, and moving the compressor station 1.9 miles to the southwest would not provide and measurable benefit. Considering these factors, we conclude that the Midland Road Alternative compressor station site does not offer a significant advantage, and we do not recommend it.

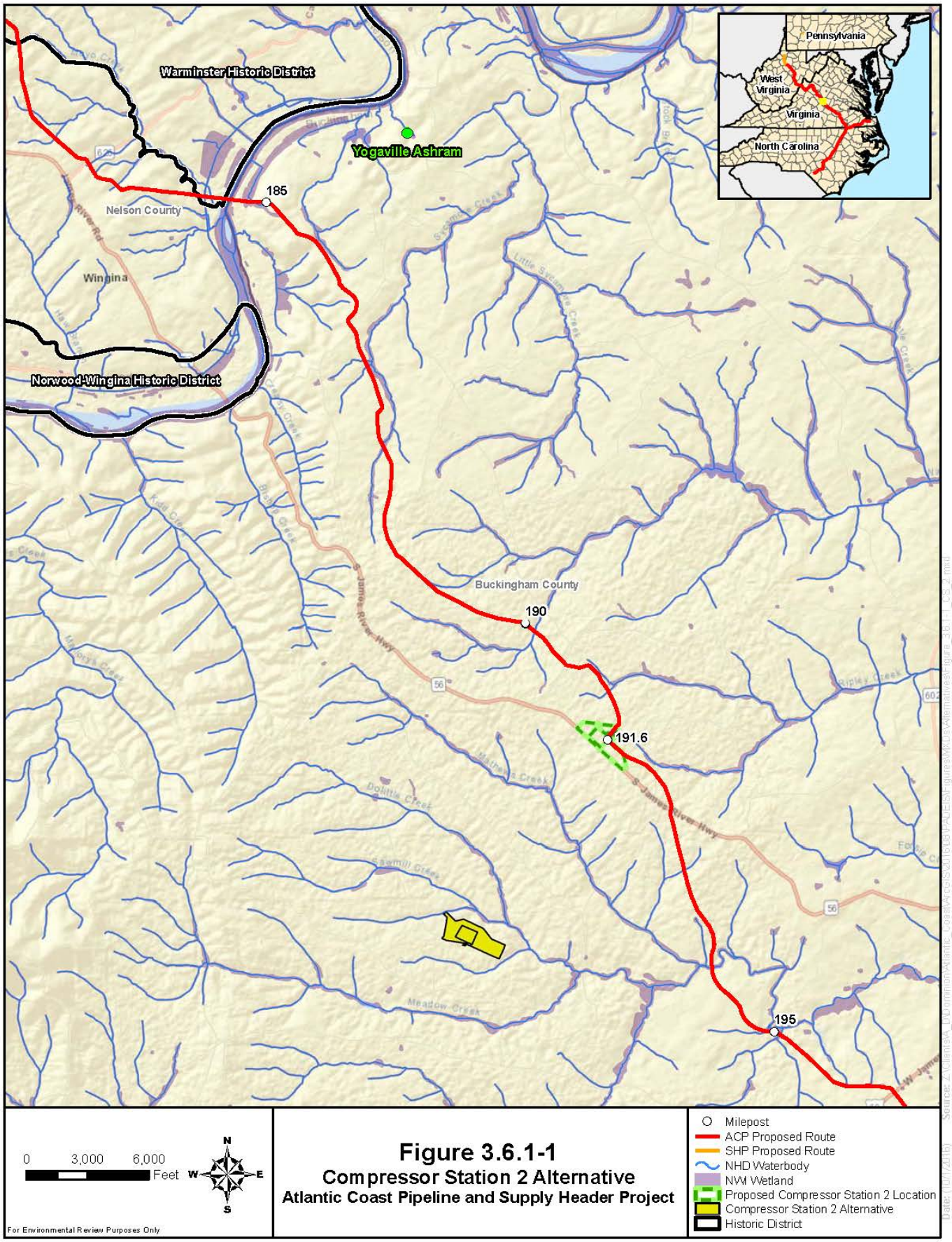

Figure 3.6.1-1
Compressor Station 2 Alternative
Atlantic Coast Pipeline and Supply Header Project

4.9 SOCIOECONOMICS

Several socioeconomic effects could occur in the states, commonwealths, counties, and communities in proximity to ACP and SHP during construction. Some of these potential effects are related to the number of construction workers that would work on the projects and their impact on population, public services, and temporary housing during construction. Other potential effects are related to construction, such as increased traffic or disruption of normal traffic patterns. Increased property tax revenue, increased job opportunities, and increased income associated with local construction employment are potential effects of the projects. Other potential effects include alteration of population levels or local demographics, increased employment opportunities, increased demand for housing and public services, tourism and transportation impacts, and an increase in government revenue associated with sales and payroll taxes.

4.9.1 Socioeconomic Study Area

The primary socioeconomic study area that we considered for this analysis includes the 32 counties and cities containing ACP and SHP project facilities (8 counties in West Virginia, 14 counties and cities in Virginia, 8 counties in North Carolina, and 2 counties in Pennsylvania). The following section analyzes impacts on the primary socioeconomic study area; however, because many parts of ACP and SHP are in rural areas, we have also identified a secondary study area. The secondary socioeconomic study area is defined as communities within a reasonable driving distance of project facilities. For this analysis, "reasonable driving distance" has been defined as a 50-mile radius centered on the pipeline centerline and major aboveground facilities. The secondary socioeconomic study area is made up of the 29 metropolitan statistical areas[22] within the 50-mile radius of ACP and SHP (see figure 4.9.1-1). Many communities within this 50-mile radius could be reasonably expected to experience impacts during the projects' construction period such as increases in traffic, increase in demand for lodging and services, and increase in local business sales. Where applicable, impacts on the secondary study area are analyzed.

4.9.2 Population and Employment

Based on 2014 population estimates, the population of all the counties and cities in ACP and SHP study area totals 2,090,064 people. ACP and SHP pipeline routes and accompanying construction work areas would generally be in rural areas, defined by the U.S. Census Bureau as an area with a population less than 50,000. With a small number of exceptions, most of the counties in the study area have population densities lower than that of their respective states. The seven counties and cities in the study area with population densities higher than that of their respective states are: Harrison County, West Virginia; the cities of Suffolk and Chesapeake, Virginia; Wilson, Johnston, and Cumberland Counties, North Carolina; and Westmoreland County, Pennsylvania. These counties and cities contain the major population centers within the study area.

The 2010[23] population of the eight West Virginia counties within the ACP and SHP study area range from 8,202 people in Doddridge County with a population density of 25.7 persons per square mile to 69,099 people in Harrison County with a population density of 166.1 persons per square mile (U.S. Census Bureau, 2010). The estimated 2014 population the West Virginia counties in the study area is 181,465 people, approximately 10 percent of the state population.

Population trends in the West Virginia counties within the ACP and SHP study area have varied over the past 14 years. Wetzel County, with a 2014 estimated population of 15,988, experienced the greatest population decrease (-9.6 percent) between 2000 and 2014. Counties also experiencing population decline during the same period were Lewis, Pocahontas, and Tyler. Doddridge County, with an estimated 2014 population of 8,391, experienced the greatest population increase (13.3 percent) between 2000 and 2014. Harrison, Randolph, and Upshur Counties also experienced population increases in the same period.

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[22] As defined by the U.S. Census Bureau, a metropolitan statistical area contains a core urban area of 50,000 or more population, consists of one or more counties containing the core urban area, as well as any adjacent counties with a high degree of social and economic integration with the urban core.

[23] The 2010 U.S. census data are presented here because the census is conducted every 10 years, which provides the official count of the population. Population counts provided by the American Community Survey (ACS) in between the decennial censuses are estimates. Both the 2010 census and ACS population estimates are appropriate to use to identify population trends.

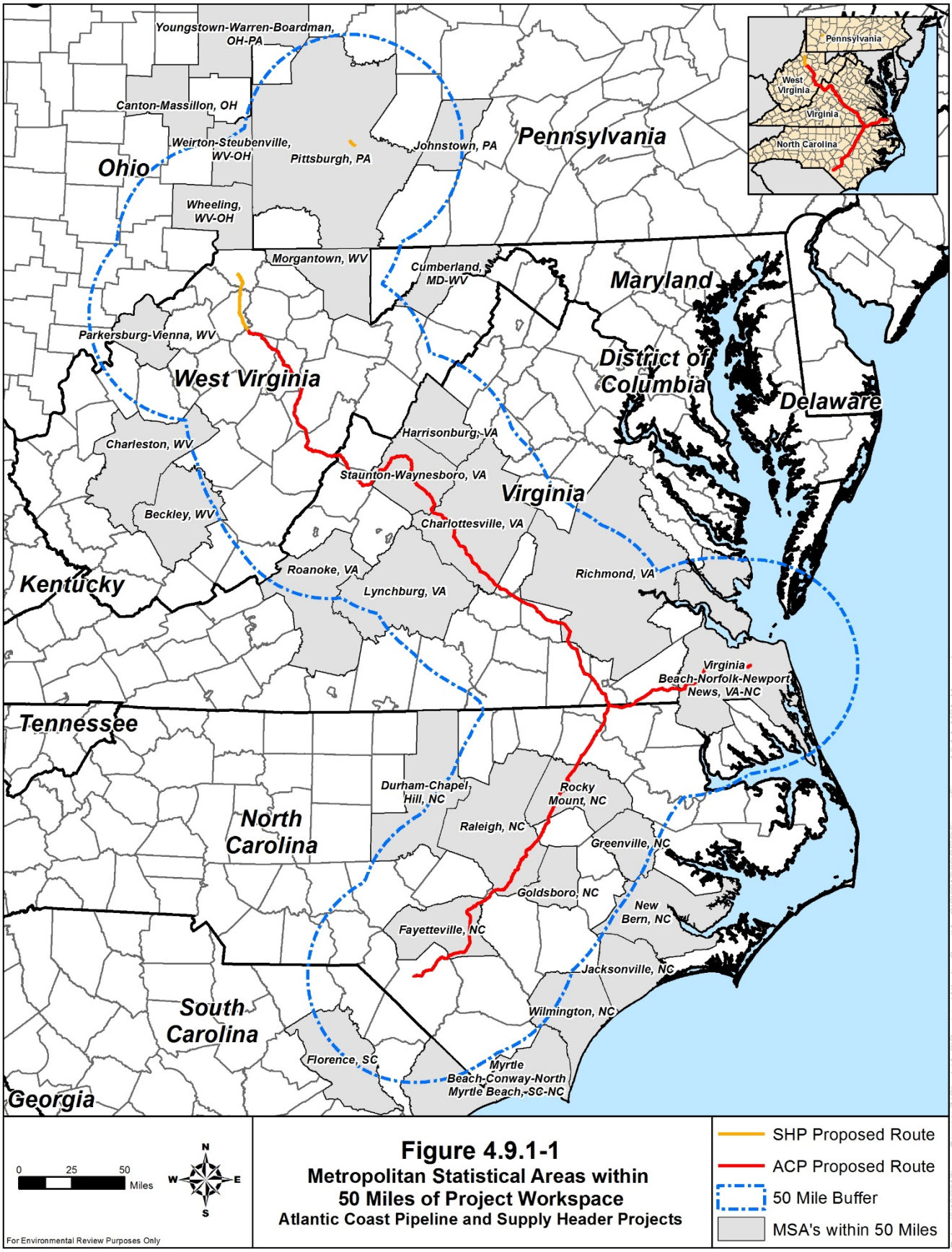

Figure 4.9.1-1
Metropolitan Statistical Areas within 50 Miles of Project Workspace
Atlantic Coast Pipeline and Supply Header Projects

In 2010, the population of the 14 Virginia counties and cities within the ACP study area ranged from 2,321 people in Highland County with a population density of 5.6 persons per square mile to 222,209 people in the City of Chesapeake with a population density of 652.0 persons per square mile (U.S. Census Bureau, 2010). The estimated 2014 population of all Virginia counties in the study area is 555,675 people, approximately 8 percent of the state population.

Most of the Virginia counties and cities in the ACP study area have experienced steady population growth over the past 14 years. The City of Suffolk, with a 2014 estimated population of 86,806, experienced the greatest population growth (36.3 percent) between 2000 and 2014. All other counties and cities in the study area in Virginia experienced population growth except for Nottoway, Brunswick, Bath, and Highland Counties. Highland County, with an estimated 2014 population of 2,248, experienced the greatest population decline (-11.4 percent) in the entire study area in the years between 2000 and 2014.

The 2010 population of the eight North Carolina counties within the ACP study area ranged from 22,099 people in Northampton County with a population density of 41.2 persons per square mile to 319,431 people in Cumberland County with a population density of 489.7 persons per square mile (U.S. Census Bureau, 2010). The estimated 2014 population of all North Carolina counties in the study area is 955,752 people, approximately 10 percent of the state population.

Most of the North Carolina counties in the ACP study area have experienced moderate to large growth in population over the past 14 years. Johnston County, with a 2014 estimated population of 181,423, experienced the greatest population growth (48.8 percent) in the entire study area between 2000 and 2014. All other counties and cities in the study area in North Carolina experienced population growth except for Northampton and Halifax Counties. Halifax County, with an estimated 2014 population of 52,970, experienced the greatest population decline (-7.7 percent) between 2000 and 2014.

In 2010, the population of the two Pennsylvania counties within the SHP study area ranged from 38,686 people in Greene County, with a population density of 67.2 persons per square mile, to 365,169 people in Westmoreland County, with a population density of 355.4 persons per square mile (U.S. Census Bureau, 2010). The estimated 2014 population of all Pennsylvania counties in the study area is 397,163 people, approximately 3 percent of the state population.

The two Pennsylvania counties in the SHP study area have experienced population declines over the past 14 years. Westmoreland County, with a 2014 estimated population of 359,320, experienced a -2.9 percent population decline while Greene County, with a 2014 estimated population of 37,843, experienced a -7.0 percent decline in population between 2000 and 2014.

Table 4.9.2-1 presents existing population levels and trends for counties and cities in the ACP and SHP study area.

Table 4.9.2-2 presents the civilian workforce numbers, per capita incomes, unemployment rates, and the leading three industries for the United States, West Virginia, Virginia, North Carolina, and Pennsylvania, and the counties and cities in the ACP and SHP study area.

TABLE 4.9.2-1

Existing Population Levels and Trends for the Atlantic Coast Pipeline and Supply Header Project Socioeconomic Study Area

Project/Location	2000 Population [a]	2010 Population [b]	2014 Population Estimate [c]	Population Density (persons/sq. mi) (2010) [b]	Population Change 2000 - 2014	Population Change 2010 - 2014
United States	**281,421,906**	**308,745,538**	**318,857,056**	**7.4**	**13.3**	**3.3**
ATLANTIC COAST PIPELINE						
West Virginia	**1,808,344**	**1,852,994**	**1,850,326**	**77.1**	**2.3**	**-0.1**
Harrison	68,652	69,099	68,761	166.1	0.2	-0.5
Lewis	16,919	16,372	16,414	42.5	-3.0	-0.3
Upshur	23,404	24,254	24,731	68.4	5.7	2.0
Randolph	28,262	29,405	29,429	28.3	4.1	0.1
Pocahontas [d]	9,131	8,719	8,662	9.3	-5.1	-0.7
Virginia	**7,078,515**	**8,001,024**	**8,326,289**	**202.6**	**17.6**	**4.1**
Highland [d]	2,536	2,321	2,248	5.6	-11.4	-3.1
Bath [d]	5,048	4,731	4,563	8.9	-9.6	-3.6
Augusta [d]	65,615	73,750	73,862	76.3	12.6	0.2
Nelson [d]	14,445	15,020	14,850	31.9	2.8	-1.1
Buckingham	15,623	17,146	16,913	29.6	8.3	-1.4
Cumberland	9,017	10,052	9,827	33.8	9	-2.2
Prince Edward	19,720	23,368	23,074	66.8	17	-1.3
Nottoway	15,725	15,853	15,579	50.4	-0.9	-1.7
Dinwiddie	24,533	28,001	27,859	55.6	13.6	-0.5
Brunswick	18,419	17,434	16,498	30.8	-10.4	-5.4
Greensville	11,560	12,243	11,681	41.5	1	-4.6
Southampton	17,482	18,570	18,059	31	3.3	-2.8
City of Suffolk	63,677	84,585	86,806	211.4	36.3	2.6
City of Chesapeake	19,184	222,209	233,371	652	17.2	5
North Carolina	**8,049,313**	**9,535,483**	**9,943,964**	**196.1**	**23.5**	**4.3**
Northampton	22,086	22,099	20,463	41.2	-7.3	-7.4
Halifax	57,370	54,691	52,970	75.5	-7.7	-3.1
Nash	87,420	95,840	94,357	177.3	7.9	-1.5
Wilson	73,814	81,234	81,401	220.6	10.3	0.2
Johnston	121,965	168,878	181,423	213.4	48.8	7.4
Sampson	60,161	63,431	64,050	67.1	6.5	1
Cumberland	302,963	319,431	326,328	489.7	7.7	2.2
Robeson	123,339	134,168	134,760	141.3	9.3	0.4
SUPPLY HEADER PROJECT						
Pennsylvania	**12,281,054**	**12,702,379**	**12,787,209**	**283.9**	**4.1**	**0.7**
Westmoreland	369,993	365,169	359,320	355.4	-2.9	-1.6
Greene	40,672	38,686	37,843	67.2	-7	-2.2
West Virginia	**1,808,344**	**1,852,994**	**1,850,326**	**77.1**	**2.3**	**-0.1**
Wetzel	17,693	16,583	15,988	46.3	-9.6	-3.6
Tyler	9,592	9,208	9,098	35.9	-5.2	-1.2
Doddridge	7,403	8,202	8,391	25.7	13.3	2.3
Harrison	68,652	69,099	68,761	166.1	0.2	-0.5

[a] U.S. Census Bureau, 2010.
[b] U.S. Census Bureau, 2013.
[c] Source: U.S. Census Bureau, 2015.
[d] Counties with federal lands crossed by the projects.

TABLE 4.9.2-2

Existing Economic Conditions for the Atlantic Coast Pipeline and Supply Header Project Study Area

Project/Location	Per Capita Income (U.S. Dollars) [a]	Civilian Labor Force [a]	Top Three Industries [b]	Unemployment Rate [c, d]
ATLANTIC COAST PIPELINE				
West Virginia	**$22,966**	**825,927**	**E, R, A**	**6.5**
Harrison	$23,309	31,932	E, R, P	5.3
Lewis	$21,175	7,027	E, R, Ag	6.2
Upshur	$19,498	10,130	E, R, Ag	6.6
Randolph	$19,595	12,611	E, R, Pu	7.1
Pocahontas [e]	$20,373	3,826	E, A, C	8.6
Virginia	**$33,493**	**4,154,410**	**E, P, R**	**5.2**
Highland [e]	$26,372	1,108	C, Ag, E	3.8
Bath [e]	$28,704	2,275	A, E, C	4.4
Augusta [e]	$25,519	35,714	E, M, R	4.7
Nelson [e]	$26,059	7,224	E, R, A	4.8
Buckingham	$17,167	6,237	E, R, Pu	6.6
Cumberland	$21,540	4,731	E, Pu, A	6.1
Prince Edward	$17,208	9,802	E, A, R	7.8
Nottoway	$19,337	6,963	E, Pu, R	5.4
Dinwiddie	$23,781	13,578	E, M, R	6.4
Brunswick	$16,060	6,948	E, R, Pu	8.2
Greensville	$16,380	3,981	M, E, R	6.7
Southampton	$22,433	8,812	E, R, Pu	5.0
City of Suffolk	$29,135	41,772	E, M, R	5.8
City of Chesapeake	$29,905	113,620	E, R, P	5.3
North Carolina	**$25,284**	**4,743,685**	**E, M, R**	**6.1**
Northampton	$17,919	9,227	E, M, Pu	7.9
Halifax	$17,937	22,911	E, M, R	9.5
Nash	$22,880	47,560	E, M, R	7.9
Wilson	$20,972	87,265	E, M, R	9.3
Johnston	$22,410	39,438	E, R, M	5.5
Sampson	$19,479	30,748	E, M, Ag	6.2
Cumberland	$23,067	134,206	E, R, A	7.8
Robeson	$15,343	54,731	E, M, R	9.2
SUPPLY HEADER PROJECT				
Pennsylvania	**$28,502**	**6,478,705**	**E, M, R**	**5.8**
Westmoreland	$28,051	184,895	E, M, R	5.7
Greene	$21,819	16,300	E, Ag, R	5.4
West Virginia	**$22,966**	**825,927**	**E, R, A**	**6.5**
Wetzel	$21,653	6,128	E, C, R	10.3
Tyler	$20,704	3,636	E, M, R	8.9
Doddridge	$17,334	3,181	E, R, Ag	4.9
Harrison	$23,309	31,932	E, R, P	5.3

[a] U.S. Census Bureau, 2015.

[b] Industries are defined under the 2012 North American Industry Classification System and abbreviated as follows: A = Arts, Entertainment, and Recreation, and Accommodation and Food services; Ag = Agriculture, Forestry, Fishing, and Hunting, and Mining; C = Construction; E = Educational, Health and Social Services; F = Finance and Insurance, and Real Estate and Rental and Leasing; I = Information; M = Manufacturing; O = Other Services, except Public Administration; P = Professional, Scientific, Management, Administrative, and Waste Management Services; Pu = Public Administration; R = Retail Trade; T = Transportation and Warehousing, and Utilities; W = Wholesale Trade.

[c] Bureau of Labor Statistics, 2014a.

[d] Bureau of Labor Statistics, 2014b.

[e] Counties with federal lands crossed by the projects.

Major industries in the West Virginia counties crossed by the within ACP and SHP are: educational health and social services; retail trade; and agriculture, forestry, fishing and hunting, and mining. According to the 2013 American Community Survey (ACS) data, the total civilian workforce in these counties is 78,471 people. The county-level civilian workforces range from 3,181 people in Doddridge County to 31,932 people in Harrison County. The estimated per capita income in 2013 in the West Virginia counties range from $17,334 in Doddridge County to $23,309 in Harrison County, with all but Harrison County having per capita incomes below the state average of $22,966. The unemployment rate is 6.5 percent in West Virginia, which is slightly higher than the national average of 6.2 percent. Five of the eight counties in West Virginia have 2014 unemployment rates that are lower than the state average. Unemployment rates within the counties in the study area vary between a high of 10.3 percent in Wetzel County and a low of 4.9 percent in Doddridge County.

Based on the 2013 ACS data, the primary industries in the Virginia counties and cities crossed by ACP are: educational health and social services; retail trade; and public administration. The total civilian workforce in these counties is 262,765 people. The county- and city-level civilian workforces range from 1,108 people in Highland County to 113,620 people in the city of Chesapeake. The estimated per capita income in 2013 in the Virginia counties and cities in the study area range from $16,060 in Brunswick County to $29,905 in the city of Chesapeake. All the Virginia counties and cities in the study area have per capita incomes below the state average of $33,493. The unemployment rate is 5.2 percent in Virginia, which is a percent lower than the national average of 6.2 percent. Ten of the 14 counties and cities in Virginia have 2014 unemployment rates that are lower than the state average. Unemployment rates within the counties and cities in the study area vary between a high of 8.2 percent in Brunswick County and a low of 3.8 percent in Highland County.

The top three industries in the North Carolina counties crossed by ACP are: educational health and social services; manufacturing; and retail trade. Based on 2013 ACS data, total civilian workforce in these counties is 426,086 people. The county-level civilian workforces range from 9,227 people in Northampton County to 134,206 people in the Cumberland County. The estimated per capita income in 2013 in the North Carolina counties in the study area range from $15,343 in Robeson County to $23,067 in Cumberland County. All the North Carolina counties in the study area have per capita incomes below the state average of $25,284. The unemployment rate is 6.1 percent in North Carolina, which is on par with the national average of 6.2 percent. All the counties in North Carolina, except for Johnston County have 2014 unemployment rates higher than the state average. Unemployment rates within the counties in the study area vary between a high of 9.5 percent in Halifax County and a low of 5.5 percent in Johnston County.

The top three industries in the Pennsylvania counties crossed by SHP are: educational health and social services; manufacturing; and retail trade. The total civilian workforce in these counties is 201,195 people. The county-level civilian workforces range from 16,300 people in Greene County to 184,895 people in the Westmoreland County. The estimated per capita income in 2013 in the Pennsylvania counties in the study area range from $21,819 in Greene County to $28,051 in Westmoreland County. Both Pennsylvania counties in the study area have per capita incomes below the state average of $28,502. The unemployment rate is 5.8 percent in Pennsylvania, slightly lower than the national average of 6.2 percent. Both Pennsylvania counties have 2014 unemployment rates lower than the state average.

Construction of ACP and SHP would temporarily increase the population in the general project area. Construction of ACP would occur over a 2-year period, beginning November 2017 through the end of 2019. Table 4.9.2-3 outlines the estimated construction schedule and peak workforce requirements for the construction of ACP and SHP. Atlantic estimates that approximately 8,400[24] total workers would be used to build ACP, all of whom would be working during peak construction. DETI estimates that approximately 1,970 construction workers would be used to construct SHP, all of whom would be working at peak construction. Peak construction is estimated to occur from mid-2018 to mid-2019 when work would be ongoing on multiple pipeline spreads and compressor stations. Population impacts resulting from construction of ACP and SHP are expected to be temporary and, given the existing populations of the counties and cities in the study area, minor. The effect on the population would be equal to the total number of non-local construction workers plus any family members accompanying them. Pipeline construction is mobile, of a short duration; and in our experience most non-local workers would not travel with their families to the ACP and SHP study area, thus minimizing temporary impacts on the local populations. Based on the populations of the counties and cities within the ACP and SHP study area, in the event some construction workers and their families do temporarily relocate to the area, the increase in population would not be significant. In addition, any temporary increase in population would be distributed throughout the study area and would not have a permanent impact on any one population.

Atlantic and DETI estimate that 82 and 10 permanent employees would be employed to support operations of ACP and SHP project facilities, respectively. Of the 82 permanent workers employed for operations of ACP, 22 jobs would be in West Virginia, 39 jobs in Virginia, 20 jobs in North Carolina, and 1 job in South Carolina. For SHP, 8 of the 10 jobs would be in West Virginia, with the remaining 2 jobs in Pennsylvania. Table 4.9.2-4 outlines the number and employment location of permanent employees for ACP and SHP. It is unknown as to whether these permanent, full-time employees would reside within commuting distance or if they would be non-local hires. Regardless, based on the county and city populations in the study area and the limited number of new, permanent employees to be hired, permanent population effects as a result of operation of ACP and SHP would be minor.

In addition to direct hires, it is reasonable to expect that the construction of ACP and SHP would result in many temporary, indirect jobs as purchases for goods and services would increase along with the influx of the construction workforce to the project area. Indirect employment, including hiring additional staff in the retail and service industries to accommodate the increase in demand for food, clothing, lodging, gasoline, and entertainment, would have a temporary stimulating effect on local economies. These indirect jobs would represent a temporary, minor increase in employment opportunities in the project area, as discussed further in section 4.9.8.

[24] Total construction workforce was estimated using the following formula: 800 construction workers and 85 inspectors for 9 construction spreads (4 of the crews used to construct the spreads in 2018 would also be used to construct spreads in 2019; Spread 12 is expected to be constructed using workers from other spreads); 225 total compressor station workers; and 30 M&R station workers at 7 stations (2 of the crews used to construct stations would also be used to construct 2 other stations).

TABLE 4.9.2-3

Construction Workforce and Schedule by Spread for the Atlantic Coast Pipeline and Supply Header Project [a]

Project/Spread	Approximate Mileposts	Counties/Cities and States/Commonwealths	Peak Workforce [b]	Begin Construction	Finish Construction [c]
ATLANTIC COAST PIPELINE					
Initial Construction Activities					
Initial Site Preparation (2018 spreads)	By spread	See below	150 [d]	November 2017	1Q 2018
Tree Clearing (2018 spreads) [e, f]	By spread	See below	300 [d]	November 2017	1Q2018
Initial Site Preparation (2019 spreads)	By spread	See below	150 [d]	September 2018	1Q 2019
Tree Clearing (2019 spreads) [e, f]	By spread	See below	300 [d]	November 2018	1Q 2019
Construction of Pipeline					
Spread 1 (AP-1)	0.0–31.6	Harrison, Lewis, and Upshur Counties, WV	885	April 2019	4Q 2019
Spread 2 (AP-1) [i]	31.6–56.1	Upshur and Randolph Counties, WV	885	April 2018	4Q 2018
Spread 2A (AP-1) [i]	56.1–65.4	Randolph County, WV	885	April 2018	4Q 2018
Spread 3 (AP-1)	65.4–79.2	Randolph and Pocahontas [h] Counties, WV	885	April 2019	4Q 2019
Spread 3A (AP-1) [i]	79.2–91.3	Pocahontas County, WV and Highland County, VA [h]	885	April 2018	4Q 2018
Spread 4 (AP-1)	91.3–103.1	Highland and Bath Counties, VA [h]	885	April 2019	4Q 2019
Spread 4A (AP-1) [i]	103.1–125.9	Bath and Augusta Counties, VA [h]	885	April 2018	4Q 2018
Spread 5 (AP-1) [j]	125.9–183.3	Augusta and Nelson Counties, VA [h]	885	February 2019	4Q 2019
Spread 6 (AP-1) [j]	183.3–239.6	Nelson [h], Buckingham, Cumberland, Prince Edward, and Nottoway Counties, VA	885	February 2018	4Q 2019
Spread 7 (AP-1)	239.6–300.0	Nottoway, Dinwiddie, Brunswick, and Greensville Counties, VA, and Northampton County, NC	885	February 2019	4Q 2018
Spread 8 (AP-2)	0.0–61.6	Northampton, Halifax, and Nash Counties, NC	885	February 2018	4Q 2018
Spread 9 (AP-2)	61.6–125.0	Nash, Wilson, Johnston, Sampson, and Cumberland Counties, NC	885	February 2019	4Q 2019
Spread 10 (AP-2)	125.0–183.0	Cumberland and Robeson Counties, NC	885	February 2018	4Q 2018
Spread 11 (AP-3)	0.0–83.0	Northampton County, NC, Greensville and Southampton Counties, VA, and the Cities of Suffolk and Chesapeake, VA	885	February 2018	4Q 2018

TABLE 4.9.2-3 (cont'd)

Construction Workforce and Schedule by Spread for the Atlantic Coast Pipeline and Supply Header Project [a]

Project/Spread	Approximate Mileposts	Counties/Cities and States/Commonwealths	Peak Workforce [b]	Begin Construction	Finish Construction [c]
Spread 12 (AP-4; AP-5)	0.0–0.4; 0.0-1.1	Brunswick County, VA; Greensville County, VA	0 [g]	February 2018	4Q 2018
Construction of Compressor Stations					
Compressor Station 1	7.6	Lewis County, WV	75	November 2017	4Q 2019
Compressor Station 2	191.5	Buckingham County, VA	75	November 2017	4Q 2019
Compressor Station 3	300.1	Northampton County, NC	75	November 2017	4Q 2019
Construction of M&R Stations					
Kincheloe	7.6	Lewis County, WV	30	November 2017	4Q 2019
Long Run	47.2	Randolph County, WV	30	April 2018	4Q 2019
Woods Corner	191.5	Buckingham County, VA	30	November 2017	4Q 2019
Smithfield	92.7	Johnston County, NC	30	November 2017	3Q 2019
Fayetteville	132.9	Johnston County, NC	30	February 2018	3Q 2019
Pembroke	183.0	Robeson County, NC	30	March 2018	3Q 2019
Elizabeth River	83.0	City of Chesapeake, VA	30	April 2018	3Q 2019
Brunswick	0.4	Brunswick County, VA	30	January 2018	3Q 2019
Greensville	1.1	Greensville County, VA	30	February 2018	3Q 2019
SUPPLY HEADER PROJECT					
Initial Construction Activities					
Initial Site Preparation (Spread 13)	By spread	See below	50 [d]	November 2017	1Q 2018
Tree Clearing (Spread 13) [e, f]	By spread	See below	65 [d]	November 2017	1Q 2018
Initial Site Preparation (Spread 14)	By spread	See below	30 [d]	November 2018	1Q 2019
Tree Clearing (Spread 14) [e, f]	By spread	See below	20 [d]	November 2018	1Q 2019
Construction of Pipeline Spreads					
Spread 13 (TL-635)	0.0–33.6	Wetzel, Doddridge, Tyler, and Harrison Counties, WV	885	April 2018	4Q 2019
Spread 14 (TL-636)	0.0–3.9	Westmoreland County, PA	885	January 2019	4Q 2019
Construction of Compressor Station Modifications					
JB Tonkin	0.0	Westmoreland County, PA	50	February 2018	3Q 2019
Crayne	NA	Greene County, PA	50	February 2018	3Q 2019
Burch Ridge	NA	Marshall County, WV	50	April 2019	4Q 2019
Mockingbird Hill	0.0	Wetzel County, WV	50	February 2018	4Q 2019
Abandonment of Gathering Compressor Units					
Hastings	NA	Wetzel County, WV	TBD	January 2019	4Q 2019

TABLE 4.9.2-3 (cont'd)

Construction Workforce and Schedule by Spread for the Atlantic Coast Pipeline and Supply Header Project [a]

Project/Spread	Approximate Mileposts	Counties/Cities and States/Commonwealths	Peak Workforce [b]	Begin Construction	Finish Construction [c]

[a] The number and timing of the construction spreads are subject to change dependent upon construction and permit requirements.

[b] The peak workforce for pipeline spreads includes 800 construction workers and 85 inspectors.

[c] The finish construction date refers to the end of mechanical construction; additional restoration and post construction activity is expected to occur in the project area beyond the timeframe reflected here. 1Q = first quarter; 2Q = second quarter; 3Q = third quarter; 4Q = fourth quarter.

[d] The workers used for initial construction activities are also expected to work on pipeline construction spreads.

[e] The start of tree clearing is dependent upon the results of the environmental surveys, agency consultations, and a Notice to Proceed issued by FERC, and possibly other permits.

[f] Including tree clearing for aboveground facilities, access roads, and contractor yards. Tree clearing for construction spreads 1-1, 1-2, 3, 4, the BRP HDD, and the James River HDD would take place in 2018.

[g] Spread 12 would be completed with spread 11 and is counted as one spread. Therefore, Spread 12 is expected to be constructed by workers accounted for in other spreads.

[h] Counties with federal lands crossed by the projects.

[i] Based on current estimates, hydrostatic testing and remaining cleanup would be completed by the 3rd quarter of 2019.

[j] The HDD crossings of the James River and the BRP/ANST would be constructed in 2018.

TABLE 4.9.2-4

Number and Location of Permanent Employees for the Atlantic Coast Pipeline and Supply Header Project

Project/Location	Number of Permanent Employees	Employment Location
ATLANTIC COAST PIPELINE		
West Virginia		
Harrison	4	Clarksburg office
Lewis	13	Compressor Station 1; Weston office (5)
Randolph	5	Elkins office
Virginia		
Buckingham	9	Compressor Station 2
City of Suffolk	1	Office
City of Richmond	29	Dominion headquarters office
North Carolina		
Northampton	15	Compressor Station 3 and office
Johnston	5	Office
South Carolina		
City of Columbia	1	Office
SUPPLY HEADER PROJECT		
Pennsylvania		
Westmoreland	2	JB Tonkin Compressor Station
West Virginia		
Wetzel	8	Mockingbird Hill Compressor Station

4.9.3 Housing

Housing statistics for the ACP and SHP study area are listed in table 4.9.3-1. At least 2,100 hotels, motels, and campgrounds are available within the ACP and SHP study area, along with over 200,000 rental housing units located in the affected counties and cities. While the study area is concentrated to the counties and cities where ACP and SHP facilities would be located, we expect some construction workers would commute up to 50 miles. There are 29 metropolitan statistical areas within 50 miles of ACP and SHP (as shown in table 4.9.3-1). These areas provide many options for hotels and motels if options are not available

in smaller communities in the study area, and would be sufficient to accommodate the estimated non-local construction workforce and non-local operations workforce.

The availability of housing in the ACP and SHP study area may fluctuate during the tourist season or local events as well as due to demand on housing from other industries. The average rental vacancy rate throughout the ACP and SHP study area is 8.6. The highest rental vacancy rates (i.e., over 10 percent) in the study area are in the following counties: Pocahontas, Randolph, and Wetzel (West Virginia); Bath, Nelson, and Dinwiddie (Virginia); and Johnston (North Carolina). See table 4.9.3-1 for the rental vacancy rates of each county and city in the ACP and SHP study area.

Atlantic and DETI estimate that approximately 50 percent of the workforce would be non-local. That equates to approximately 5,815 non-local workers representing a demand on local temporary housing in the ACP and SHP study area. Using a conservative estimate of 25 units per hotel/motel or campground, of which there are approximately 2,115, we estimate that there are at least 52,875 rooms/sites available in the study area. Given the rental vacancy vacancies in the counties and cities in the study area (between 0.6 percent in Cumberland County and 59.6 percent in Pocahontas County) and number of hotel/motel rooms available in study area, there are sufficient vacant housing units to meet the increase in demand caused by the influx of the non-local construction workforce.

In the event that non-local workers prefer to house in a hotel/motel or campground and the number identified in this primary analysis area (i.e., the counties and cities where ACP and SHP cross or facilities are located) does not meet the need within a particular county or city, it can be reasonably expected that construction workers could find housing options in the nearby metropolitan statistical areas (see figure 4.9.1-1).

The influx of non-local construction workers to the ACP and SHP study area would result in a minor, temporary increase in the demand for rental housing and/or hotel/motel rooms and campground sites. The projects could have a short-term positive impact on the area rental industry through increased demand and higher rates of occupancy; however, no significant impacts on local housing markets are expected. Increased demand in the study area could benefit the proprietors of the local motels, hotels, and other rental units through increased revenue; however, it could increase competition (and cost) for short-term housing and could decrease housing availability for tourists, recreationalists, and local renters or residents. While some construction activity would be conducted during the peak tourism season, sufficient temporary housing is still likely to be available for tourists; however, it may be more difficult to find (particularly on short notice) and/or more expensive to secure.

Based on the large number of accommodations in the ACP and SHP study area and surrounding areas, we have determined that rental housing accommodations along with hotels, motels, and campgrounds, would be sufficient to house the non-local construction workforce without significantly impacting or displacing tourists or local renters and residents. The increase in demand for short-term housing from non-local construction workers during the construction of ACP and SHP would be temporary and minor. In addition, we conclude the estimated 92 non-local employees needed during operations would not have a noticeable impact on housing resources in the project area.

TABLE 4.9.3-1

Available Housing in the Atlantic Coast Pipeline and Supply Header Project Study Area

Location	Total Housing Units [a]	Owner Occupied [a]	Renter Occupied [a]	Median Gross Rent ($) [a]	Rental Vacancy Rate (%) [a]	Vacant Housing Units	Hotels and Motels [b]	Campgrounds/ RV Parks [c]
ATLANTIC COAST PIPELINE								
West Virginia	880,951	544,059	197,331	611	7.8	139,561	1,508	297
Harrison	31,443	20,508	7,091	615	7.1	3,844	65	3
Lewis	7,928	4,617	1,834	507	3.2	1,477	41	4
Upshur	11,082	6,955	2,056	566	6.7	2,071	43	8
Randolph	11,163	8,396	2,767	534	10.4	3,000	49	6
Pocahontas [c]	8,814	3,023	671	578	59.6	5,120	48	8
Virginia	3,381,332	2,033,102	989,637	1,087	6.7	358,593	4,008	353
Highland [c]	1,840	868	138	490	4.8	834	32	2
Bath [c]	3,242	1,600	501	764	10.8	1,141	43	5
Augusta [c]	31,362	22,662	5,337	743	7.2	3,363	129	9
Nelson [c]	9,957	4,856	1,548	709	13.0	3,553	49	5
Buckingham	7,224	4,420	1,397	708	0.8	1,407	36	6
Cumberland	4,627	3,134	915	838	0.6	578	29	5
Prince Edward	9,170	4,856	2,597	760	3.9	1,717	16	2
Nottoway	6,670	3,674	1,999	802	2.8	997	32	3
Dinwiddie	11,452	7,607	2,325	905	16.5	1,520	48	7
Brunswick	8,140	4,207	1,619	617	8.3	2,314	55	6
Greensville	4,093	2,568	821	720	8.2	704	61	6
Southampton	7,492	4,815	1,893	734	5.7	784	33	3
Suffolk, City of	33,372	22,373	8,119	986	6.9	2,880	70	3
Chesapeake, City of	84,403	57,579	21,842	1,160	5.6	4,982	203	10
North Carolina	4,349,023	2,466,388	1,249,177	776	8.7	633,458	4,947	683
Northampton	11,587	6,276	2,328	622	5.6	2,983	57	4
Halifax	17,990	10,672	4,098	568	7.4	3,220	54	5
Nash	42,256	24,186	13,540	751	6.7	4,530	89	3
Wilson	35,520	19,314	12,376	738	4.9	3,830	86	4
Johnston	68,000	43,495	17,264	778	10.3	7,241	60	10
Sampson	27,083	16,147	7,189	572	8.2	3,747	48	5
Cumberland	138,362	66,427	54,799	853	8.5	17,136	115	7
Robeson	52,412	29,311	15,843	592	6.5	7,258	79	4
SUPPLY HEADER PROJECT								
Pennsylvania	5,565,653	3,462,512	1,495,915	813	6.1	607,226	4,738	720
Westmoreland	168,084	116,000	36,109	637	4.8	15,975	96	14
Greene	16,427	10,526	3,891	597	4.7	2,010	47	20
West Virginia	880,951	544,059	197,331	611	7.8	139,561	1,508	297
Wetzel	8,152	5,473	1,430	494	11.4	1,249	36	3
Tyler	4,995	3,000	712	499	5.5	1,283	38	3
Doddridge	3,932	2,300	478	544	1.6	1,154	36	8
Harrison	31,443	20,508	7,091	615	7.1	3,844	65	3

[a] U.S. Census Bureau, 2013.

[b] Yellowbook, 2016.

[c] Counties with federal lands crossed by the projects.

Note: Inventory of hotels, motels, and campgrounds was collected for only those counties where facilities are located and that the pipeline crosses. Data were not collected for states.

4.9.4 Public Services

A wide range of public services and facilities are offered in the ACP and SHP study area. Services and facilities include hospitals, full-service law enforcement, paid and volunteer fire departments, and schools. Table 4.9.4-1 provides an overview of select public services available by county/city near the study area. All counties and cities within the ACP and SHP study area have at least one police department and one fire department, except for Greensville County, Virginia (ACP study area). At least one hospital is present in 7 of the 8 counties in West Virginia, 6 of the 14 counties and cities in Virginia, 7 of the 8 counties in North Carolina, and all the counties in Pennsylvania within the ACP and SHP study area.

In West Virginia, 32 police departments are located within the study area, with the greatest number in Harrison County and the least in Doddridge and Lewis Counties. The number of local fire departments ranges from 20 in Harrison County to 5 in Tyler County, for a total of 74 within the study area in West Virginia. There are nine hospitals available in the study area in West Virginia, with at least one hospital present in all counties, except for Doddridge. The greatest number of public schools are in Randolph County and the least number in Doddridge County.

In Virginia, 23 police departments are located within the study areas, with the number of police departments ranging from 1 to 3 per county or city. The number of local fire departments ranges from 16 in Augusta County to none in Greensville County, for a total of 77 within the study areas in Virginia. There are 9 hospitals available in the study area in Virginia, however there are no hospitals in 8 of the 14 counties and cities in the study area. The greatest number of public schools are in the City of Chesapeake and the least number in Highland County.

In North Carolina, 50 police departments are located within the study area, with the greatest number in Johnston County and the least in Sampson and Cumberland Counties. The number of local fire departments ranges from 36 in Robeson County to 10 in Northampton County, for a total of 170 within the study area in North Carolina. There are 10 hospitals available in the study area in North Carolina, with at least 1 hospital in all counties except for Northampton County. The greatest number of public schools are in Cumberland County and the least number in Northampton County.

In Pennsylvania, 49 police departments are located within the study area, with all but 3 in Westmoreland County. There are 38 local fire departments in the study area, 22 in Westmorland County and 16 in Greene County. There are 8 hospitals and 106 public schools in the study area in Pennsylvania.

Based on the total number and location of police departments (164) and fire departments (388), public schools (600), and hospitals (38), there appears to be adequate public service infrastructure near the projects to accommodate the temporary needs of the non-local construction workforce and long-term needs of non-local operations and maintenance workers, while not compromising services to residents and tourists. Further, Atlantic and DETI would require each of its contractors to have a health and safety plan, covering location- or work-specific requirements to minimize the potential for on-the-job accidents. Contractors and Atlantic's and DETI's site safety staff would be responsible for monitoring compliance with the plans. In the event of an accident, police, fire, and/or medical services could be necessary; however, the anticipated demand for these services is not expected to exceed existing capabilities in the study area.

TABLE 4.9.4-1

Public Services Available in Atlantic Coast Pipeline and Supply Header Project Study Area

Project/Location	Fire Departments [a, b, c, d]	Nearest Distance to Mainline/ Facility (miles)	Police Departments	Nearest Distance to Mainline/ Facility (miles)	Hospitals [f, g, h, i]	Nearest Distance to Mainline/ Facility (miles)
ATLANTIC COAST PIPELINE						
West Virginia						
Harrison	20	7.8	10	7.8	2	9.3
Lewis	7	0.6	2	3.6	2	5.5
Upshur	8	2.8	3	0.4	1	2.6
Randolph	11	1.1	4	15.8	1	15.6
Pocahontas [j]	6	2.9	3	9.6	1	9.3
Virginia						
Highland [j]	4	1.7	1	14.9	0	23.5
Bath [j]	10	0.7	1	6.8	1	15.4
Augusta [j]	16	2.4	2	3.2	2	4.7
Nelson [j]	7	3.2	1	5.2	0	11.6
Buckingham	4	6.7	1	7.2	0	5.9
Cumberland	3	4.2	1	4.2	0	4.3
Prince Edward	5	5.4	2	5.4	1	5.4
Nottoway	3	4.9	3	2.6	0	2.9
Dinwiddie	6	6.8	1	6.6	0	16.3
Brunswick	7	2.3	2	7.2	0	7.0
Greensville	0	3.4	1	3.6	0	3.1
Southampton	8	1.9	3	2.6	1	2.8
City of Suffolk	5	1.6	2	1.3	2	1.3
City of Chesapeake	1	1.3	2	1.2	2	1.2
North Carolina						
Northampton	10	1.8	5	1.8	0	4.7
Halifax	17	1.7	5	1.7	2	3.5
Nash	20	3.6	7	1.8	2	3.6
Wilson	19	2.9	6	3.4	1	7.7
Johnston	29	2.2	10	1.2	1	2.6
Sampson	19	1.2	4	4.3	1	4.8
Cumberland	20	1.5	4	4.3	2	8.2
Robeson	36	1.3	9	2.0	1	3.1
SUPPLY HEADER PROJECT						
Pennsylvania						
Westmoreland	22	4.3	46	3.1	7	6.6
Greene	16	2.5	3	2.6	1	1.5
West Virginia						
Wetzel	11	1.0	4	7.7	1	10.3
Tyler	5	11.6	4	11.2	1	18.8
Doddridge	6	4.1	2	4.5	0	14.6
Harrison	20	7.8	10	7.8	2	9.3

TABLE 4.9.4-1 (cont'd)

Public Services Available in Atlantic Coast Pipeline and Supply Header Project Study Area

Project/Location	Fire Departments [a, b, c, d]	Nearest Distance to Mainline/ Facility (miles)	Police Departments	Nearest Distance to Mainline/ Facility (miles)	Hospitals [f, g, h, i]	Nearest Distance to Mainline/ Facility (miles)

[a] West Virginia Fire and EMS Department Directory, 2015.
[b] Virginia Department of Fire Programs, 2014.
[c] CarolinaFirePage.com, 2015.
[d] USA Fire and Rescue, 2014.
[e] USACOPS, 2013.
[f] West Virginia Department of Military Affairs and Public Safety, 2015.
[g] North Carolina Department of Health and Human Services, 2015.
[h] Hospitals Center, 2014.
[i] Pennsylvania Department of Health, 1999.
[j] Counties with federal lands crossed by the projects.

Temporary increased demand on local public services may occur including the need for local police to direct traffic during construction at road crossings or respond to emergencies associated with pipeline construction. Fire departments may have to respond to project-related fires or other emergencies, and medical services may be necessary for workforce personnel illnesses or injuries. Atlantic and DETI would work with local law enforcement, fire departments, and emergency medical services prior to construction to coordinate for effective emergency response. In addition, Atlantic and DETI would work with local emergency responders and hospitals to coordinate for effective emergency response in remote areas, and would confirm location and availability of airlift services during construction. Construction team leaders would develop tailored emergency response plans with the appropriate emergency response support staff in each of the counties and cities in the study area. The response plans would consider the location-specific construction and operations activities as well as the capabilities and needs of each county and city along the proposed pipeline routes. Wall maps and/or digital shapefiles of the pipeline centerline would be provided to emergency responders in the study area. Additionally, to mitigate the reliance on local medical services for minor first-aid related to on-the-job injuries, Atlantic's and DETI's construction contractors would set up medipods for treatment of minor injuries on site.

It is anticipated that most non-local construction workers would not relocate their families temporarily during the construction period, and as such it is not anticipated ACP and SHP would increase demand for school-related services. As indicated previously, a small number of non-local permanent operations employees (i.e., 82 and 10 for ACP and SHP, respectively), and potentially their families, would relocate to the project area (see table 4.9.2-4). Due to the small number of permanent employees relative to the existing population, we conclude there would not be significant increased demand for school-related services resulting from non-local operations employees relocating to the project area.

Constructing ACP and SHP would not significantly affect public services in the affected counties or communities due to the short duration of each construction phase and the large area over which the workforce would be dispersed. The communities in the project vicinity presently have and are presumed to continue to have adequate infrastructure and services to meet the potential needs of non-local workers who enter the area temporarily.

We received several comments about the safety of a high-pressure pipeline in or near population centers and/or near schools and child daycare and elderly facilities. As further discussed in section 4.12, Atlantic and DETI would construct, operate, maintain, and inspect the proposed facilities to meet or exceed DOT's PHMSA's safety requirements, which have pipeline design requirements that are dependent on the population levels and facilities crossed.

We received several comments from residents expressing concerns about the costs and ability for emergency public services to respond in the event of an accident along the pipeline route or at any project facilities. As discussed in section 4.12, a catastrophic accident is unlikely based on statistical data. Atlantic and DETI would develop, maintain, and implement emergency response plans as required by applicable DOT regulations. Atlantic and DETI would also communicate regularly with the emergency response personnel regarding pipeline safety and emergency response plans.

4.9.5 Tourism

Tourism opportunities in the ACP and SHP study area include federal, state, and local special interest areas. Federal areas in the study area include National Forests, national scenic and recreational trails, WMAs, and a National Scenic Byway. These areas are discussed in more detail in section 4.9.10. In addition, there are many state/commonwealth parks, Civil War historical sites, and private recreation and special interest areas in or near the project area. Recreation and special interest areas are discussed in detail in section 4.8.5.

Tourism opportunities in the ACP and SHP study area are largely associated with outdoor recreational opportunities, and tourist attractions and general recreation areas are located throughout the study area. Travel-related spending supports local economies in the study area, and there are businesses in and around the study area that are dependent on year-round as well as seasonal tourists.

Travel-related spending in the West Virginia counties in the ACP and SHP study area totaled approximately $392 million in 2012, and 4,550 jobs in the West Virginia portion of the study area were attributed to travel-generated employment. Travel-related spending in the Virginia, North Carolina, and Pennsylvania counties and cities in the ACP and SHP study area totaled approximately $3.2 billion in 2013, and over 27,000 jobs in this portion of the study area were attributed to travel-generated employment. Table 4.9.5-1 provides an overview of the economic impacts of travel-related spending in the counties and cities in the ACP and SHP study area.

Travel-related spending in West Virginia in 2012 totaled more than $5.1 billion. Travel-related spending totaled $392.4 million and created approximately 4,550 jobs (approximately 6 percent of the total workforce in the eight counties) in the West Virginia counties in the study area.

In 2013, travel-related spending in Virginia totaled $21.5 billion in 2013. Travel-related spending totaled $1.06 billion and created over 9,400 in the 14 counties and cities in Virginia in the study area.

In North Carolina in 2013, travel-related spending totaled $21.2 billion. Travel-related spending in the North Carolina counties in the ACP study area totaled $1.31 billion and created over 11,400 jobs.

Travel-related spending in Pennsylvania totaled $15.3 billion in 2013. Travel-related spending totaled $834.1 million and created over 6,200 jobs in the Pennsylvania counties in the study area.

While visits to the recreational and special interest areas in the ACP and SHP study area occur year-round, tourism season is generally considered to be from late March through October, with peak season typically from between Memorial Day (late May) through Labor Day (early September), with additional peaks in the spring for blooming season and in mid-October around fall foliage season.

TABLE 4.9.5-1

Economic Impact of Travel in the Atlantic Coast Pipeline and Supply Header Project Study Area: Spending, Earnings, and Employment

Location	Travel Spending ($ million)	Travel Earnings ($ million)	Total Travel Tax Receipts [a] ($ million)	Travel-Generated Employment
West Virginia [b]	**5,103.0**	**1,075.0**	**637.0**	**46,400**
Harrison	142.2	37.2	11.1	1,530
Lewis	47.3	12.1	3.7	530
Upshur	34.4	8.8	2.4	410
Randolph	48.3	12.5	3.6	650
Pocahontas [f]	79.6	21.3	6.3	1,040
Wetzel	27.5	4.7	2.1	260
Tyler	6.4	1.3	0.57	80
Doddridge	6.7	1.2	0.5	50
Virginia [c]	**21,500.0**	**4,900.0**	**1,300.0**	**212,995**
Highland [f]	16.6	3.3	1.3	175
Bath [f]	250.7	30.3	10.5	1,670
Augusta [f]	110.1	19.2	8.5	1,008
Nelson [f]	180.2	31.1	13.2	1,617
Buckingham	11.3	2.3	0.9	119
Cumberland	5.5	1.0	0.4	54
Prince Edward	19.8	4.0	1.2	214
Nottoway	12.6	2.4	1.0	125
Dinwiddie	13.0	2.7	0.9	133
Brunswick	36.4	7.5	2.4	420
Greensville	15.7	2.5	1.0	128
Southampton	14.5	2.9	1.0	148
Suffolk	64.9	10.0	3.7	531
Chesapeake	312.9	57.2	24.7	3,059
North Carolina [d]	**21,200.0**	**4,600.0**	**1,600.0**	**206,700**
Northampton	13.1	1.5	1.65	50
Halifax	84.3	9.8	7.1	510
Nash	257.7	31.1	20.1	2,830
Wilson	104.0	14.8	7.9	800
Johnston	204.5	30.4	16.2	1,660
Sampson	46.1	5.8	3.9	280
Cumberland	472.0	84.9	34.5	4,220
Robeson	127.6	18.5	9.7	1,050
Pennsylvania [e]	**15,316**	**10,568.8**	**4,123.6**	**304,155**
Westmoreland	742.3	131.3	38.3	5,723
Greene	91.8	11.1	4.3	486

[a] Total travel tax receipts include both local and state travel-related tax receipts.
[b] Dean Runyan and Associates, 2012.
[c] U.S. Travel Association, 2014a.
[d] U.S. Travel Association, 2014b.
[e] Tourism Economics, 2015.
[f] Counties with federal lands crossed by the projects.

The influx of construction workers would be limited to the time of construction and dispersed across the ACP and SHP study area throughout the construction period. The demand for temporary housing by non-local workers is not expected to exceed the available number of hotels, motels, and campground

units in the study area, but accommodations in the study area could experience some minor limited availability, particularly during planned construction periods in the late-spring through the fall of 2017 and 2018, which is peak tourism season in the project area. These strains would be most likely experienced in the counties of Pocahontas, West Virginia and Highland, Bath, Augusta, and Nelson Counties, Virginia where there are many federal, state, and private recreation and special interest areas; however, sufficient temporary housing accommodations exist in these counties, the project area, and in the metropolitan statistical areas in a 50-mile radius of project facilities. Section 4.9.3 discusses impacts on housing (including hotel/motel/campground rentals).

We received comments regarding potential negative effects on natural resources and the environment from construction and operation of ACP and SHP, and that such effects would negatively affect tourism in the study area. Commenters expressed concerns that project-related environmental impacts would destroy species habitat and either kill off or displace species of interest to fishermen, hunters, and tourists that come to the project area for these recreational activities. We also received comments regarding the potential for negative effects on recreation, aesthetic, and visual resources, and that such efforts would also negatively affect tourism in the project area. As discussed in sections 4.3.2, 4.4, 4.5, and 4.6, we conclude that implementation of Atlantic's and DETI's construction plans at waterbody crossings and restoration and revegetation measures along the construction right-of-way would reduce impacts on water quality, vegetation, wildlife, and aquatic resources, respectively. As discussed in section 4.8.5, short-term temporary hunting impacts may occur during construction and restoration of the projects; however, these would not represent a significant impact because the areas outside of the construction workspace would remain available for hunting. Following construction, access to available hunting areas would be allowed to resume and operation of the projects would not affect future hunting activities. As discussed in section 4.8.8, in most land uses, ACP and SHP would not result in significant or long-term visual impacts because the pipeline would be installed below ground and the right-of-way and ATWS would be restored and revegetated after construction in accordance with Atlantic's and DETI's *Restoration and Rehabilitation Plan*.

We received comments expressing concern that the tourism economy in the Rockfish Valley and Wintergreen area in Nelson County, Virginia would be negatively impacted by construction and operation of the projects. The Rockfish Valley and Wintergreen area includes Spruce Creek Park, Wintergreen Country Store, Elk Hill Baptist Church, Nelson Scenic Loop Trail, the Rockfish Valley Kite Festival Grounds, Wintergreen Resort, along with several wineries, microbreweries, and resort areas. Commenters expressed concern that ACP would adversely affect environmental resources; reduce food, shelter, and habitat for wildlife; and diminish enjoyment of the trail for visitors, thereby affecting the tourism economy in the area.

We received comments on the draft EIS expressing concern that the tourism economy in Pocahontas County, West Virginia would be negatively impacted by construction and operation of the projects. Pocahontas County includes the MNF, the Greenbrier River and the River Rail-Trail, Seneca State Forest, the Allegheny Trail, and Snowshoe Resort, along with other recreational areas. Commenters expressed concern that ACP would adversely affect environmental resources and diminish enjoyment of the area for visitors, thereby affecting the tourism economy in the area.

Scenic travelers and tourists to Rockfish Valley and Pocahontas County would experience temporary visual and noise impacts associated with construction personnel and equipment and vegetation removal associated with construction workspaces. Atlantic would coordinate with Rockfish Valley, Wintergreen, and Pocahontas area businesses and recreational stewards to inform them of construction schedules and traffic volumes and would, to the extent practicable, schedule construction activities to avoid conflicts with special events. We have found no evidence that short-term effects of pipeline construction have long-term significant impacts on the tourism industry in areas where pipeline construction has

occurred. As such, we conclude recreational uses and tourism activities in the project area would not be affected by operation of the project. Additional discussion regarding impacts on waterbodies and wetlands, vegetation, wildlife, and aquatic resources in the Rockfish Valley area and Pocahontas County is provided in sections 4.3.2, 4.3.3, 4.4, 4.5, and 4.6, respectively; discussion of recreation and special interest areas is provided in section 4.8.5; and discussion of historic and archaeological sites and the South Fork Valley Rural Historic District, including Elk Hill Farm, is provided in section 4.10.1.1.

We received comments that construction and operation of ACP would affect the peaceful and serene environment at the Satchidananda Ashram and Light of Truth Universal Shrine at Yogaville, located in Buckingham County, Virginia. Yogaville is over 4 miles from the proposed Compressor Station 2; and the Light of Truth Universal Shrine at Yogaville is 1 mile from the proposed ACP route alignment and over 1 mile from the nearest proposed HDD location. We believe that the project locations are sufficiently distant from the Yogaville properties so that people enjoying the peaceful and serene environment would not be disturbed by project construction or operation. Therefore, we conclude no direct or indirect impacts on tourism and visitation to Yogaville would result from construction and operation of the projects.

Though ACP would cross linear trails where a detour or temporary closure may be required, Atlantic has proposed general mitigation measures and committed to developing site-specific crossing plans in consultation with the applicable land-managing agency. The ANST, one of such trails to be crossed by the project, offers backcountry recreation and hiking opportunities and is visited by over 2.5 million people annually (NPS, 2016h). Based on the impacts identified and Atlantic's proposed measures to reduce impacts, we conclude the project would not result in significant or adverse impacts on recreational or special interest areas. As such, and given the relative short timeframe for construction, we conclude the projects would not result in significant or adverse long-term impacts on tourism.

4.9.6 Transportation and Traffic

The local roads and highway systems near ACP and SHP are primarily easily accessed by interstate highways, U.S. Highways, state highways, secondary state highways, country roads, and private roads. ACP and SHP may temporarily impact transportation and traffic during construction across and within roadways and railroads and from an increase in vehicle traffic associated with the commuting of the construction workforce to the project area and the movement of construction vehicles and delivery of equipment and materials to the construction work areas.

Atlantic and DETI estimate a total of 125 to 150 vehicle trips per day for Spreads 1 through 5, and 90 to 115 vehicle trips per day for Spreads 6 through 13. It is further estimated that there would be approximately 325 to 400 vehicles total used to construct each pipeline spread. Estimated trips and vehicle numbers include commuter trips and vehicles along with delivery trucks for the delivery of equipment, pipe, and other materials to the construction areas. Atlantic and DETI anticipate busing crews to work areas from contractor yards or other predetermined locations and anticipate some ridesharing among inspection and other crews, thereby reducing passenger vehicle traffic on local roads. Vehicle use by construction personnel would primarily take place in the early morning and late evening (i.e., just prior to and just after construction hours). During construction, vehicles would be distributed across the ACP and SHP area. See table 4.9.6-1 for average daily traffic counts on the major roads in the ACP and SHP area.

Construction activities in the ACP and SHP study area would result in temporary effects on local transportation infrastructure and vehicle traffic, including disruptions from increased transportation of construction equipment, materials, and workforce; disruptions from construction of pipeline facilities at or across existing roads; and damage to local roads caused by heavy machinery and materials.

TABLE 4.9.6-1

Primary Transportation Routes and Annual Daily Traffic Counts for the Atlantic Coast Pipeline and Supply Header Project

Project/Location	Spread	Primary Routes	Annual Average Daily Traffic [a, b, c, d, e]
ATLANTIC COAST PIPELINE			
West Virginia			
Harrison	Spread 1 (AP-1)	Hwy 19	1,933
		I-79	51,938
		Hwy 33	4,459
Lewis	Spread 1(AP-1)	Hwy 19	2,356
		I-79	27,360
		Hwy 33	14,903
Upshur	Spread 1 and 2 (AP-1)	Hwy 19	4,459
		I-79	18,744
		Hwy 33	3,949
		Hwy 20/11	5,046
		Hwy 250	4,360
Randolph	Spread 2a and 3 (AP-1)	Hwy 20/11	5.046
		Hwy 250	5,019
		US 219	1,691
Pocahontas [f]	Spread 3 and 3a (AP-1)	Hwy 250	1,814
		WV 28	1,399
		WV 92	469
Virginia			
Highland [f]	Spread 3a and 4 (AP-1)	Hwy 250	1,000
Bath [f]	Spread 4 (AP-1)	Hwy 220	2,400
Augusta [f]	Spread 4 and 5 (AP-1)	Hwy 250	2,500
		I-64	18,000
		Hwy 29	13,000
Nelson [f]	Spread 5 and 6 (AP-1)	Hwy 250	7,800
		I-64	18,000
		Hwy 29	16,000
		Hwy 151	9,100
		Hwy 6	4,500
Buckingham	Spread 6 (AP-1)	Hwy 15	8,400
		Hwy 360	5,600
Cumberland	Spread 6 (AP-1)	Hwy 15	3,800
		Hwy 360	3,600
Prince Edward	Spread 6 (AP-1)	Hwy 15	9,600
		Hwy 360	4,800
Nottoway	Spread 6 and 7 (AP-1)	Hwy 15	9,600
		Hwy 360	5,000
Dinwiddie	Spread 7 (AP-1)	Hwy 15	9,600
		Hwy 360	5,700
Brunswick	Spread 7 and 12 (AP-1; AP-4)	Hwy 15	4,400
		Hwy 360	6,300
Greensville	Spread 7 and 12 (AP-1; AP-5)	Hwy 15	4,400
		Hwy 360	4,800
Southampton	Spread 11(AP-3)	Hwy 58	18,000
Suffolk, City of	Spread 11 (AP-3)	Hwy 58	27,000

TABLE 4.9.6-1 (cont'd)

Primary Transportation Routes and Annual Daily Traffic Counts for the Atlantic Coast Pipeline and Supply Header Project

Project/Location	Spread	Primary Routes	Annual Average Daily Traffic [a, b, c, d, e]
Chesapeake, City of	Spread 11 (AP-3)	Hwy 13	30,000
North Carolina			
Northampton	Spread 7 and 8 (AP-1; AP-2)	Hwy 301	1,360
		I-95	33,000
Halifax	Spread 8 (AP-2)	I-95	36,000
Nash	Spread 8 and 9 (AP-2)	I-95	38,000
Wilson	Spread 9 (AP-2)	I-95	39,000
Johnston	Spread 9 (AP-2)	I-95	23,000
Sampson	Spread 9 (AP-2)	I-95	21,000
Cumberland	Spread 9 and 10 (AP-2)	I-95	25,000
Robeson	Spread 10 (AP-2)	I-95	18,000
SUPPLY HEADER PROJECT			
Pennsylvania			
Westmoreland	Spread 14 (TL-636)	I-76	34,000
		Hwy 22	16,000
Greene	Spread 14 (TL-636)	I-79	33,000
West Virginia			
Wetzel	Spread 13 (TL-635)	Hwy 20	1,827
Tyler	Spread 13 (TL-635)	Hwy 20	5,566
Doddridge	Spread 13 (TL-635)	Hwy 23	1,362
		Hwy 50	16,302
Harrison	Spread 13 (TL-635)	Hwy 19	5,974

[a] Annual Average Daily Traffic counts taken from the nearest road segment.
[b] WVDOT, 2013.
[c] VDOT, 2014.
[d] NCDOT, 2014
[e] Pennsylvania Department of Transportation, 2016.
[f] Counties with federal lands crossed by the projects.

Public roads used to travel to and from workspaces by construction vehicles could experience increased sediment tracking/build-up and surface damage. FS roads would be properly constructed and/or maintained so that road damage does not occur during the duration of use. Therefore, FS roads should not experience increased sediment tracking or build-up or surface damage, and any damaged roads would be repaired to preconstruction conditions. Paved roads are the most durable and generally can withstand periodic surges in traffic and heavy use; unpaved roads, however, are much less durable. Atlantic and DETI would coordinate with appropriate transportation authorities to assess the need for road repair after construction of the projects. In addition, Atlantic and DETI would repair any damages to roadway surfaces as required in the FERC *Plan* (section IV.E.3).

Atlantic and DETI would utilize up-to-date traffic information for each construction spread to identify measures to minimize short-term impacts on roads in the ACP and SHP project area. Most states fund road repairs with motor fuel taxes, motor vehicle registration fees, and compensatory fees paid by commercial carriers. Commercial carriers need registrations to operate in each state and may need special permits for oversize and overweight vehicles, temporary trip permits within the state, or to haul hazardous materials. Atlantic and DETI would coordinate with state and local departments of transportation and land-managing agencies to obtain the required permits to operate trucks on public roads. Atlantic and DETI

would also coordinate with landowners and tenants in the areas where local, private roadways may be impacted during construction.

To minimize and mitigate potential impacts, Atlantic and DETI would prepare spread-specific traffic and transportation management plans for managing vehicle traffic during construction of the projects – considering peak travel times, emergency services, and residential traffic. To further minimize and mitigate potential impacts, Atlantic and DETI would limit construction activities to between 6:00 a.m. and 6:00 p.m., to the extent practicable; therefore, workers would travel to and from the site earlier and later in the day, outside of peak traffic hours, and thus minimizing their contribution to traffic congestion.

ACP and SHP would cross most paved roads, highways, and railroads via conventional subsurface bore (described in section 2.3.3.8), resulting in little to no disruption to traffic or road impacts. Smaller roads would be crossed using the open-cut method, usually requiring temporary road closures and/or detours. Where detours are infeasible, crews would leave at least one road lane open to maintain traffic flow, except when installing the pipeline, and use necessary signage and traffic control measures to ensure continued traffic flow during construction. Most open-cut crossings are resurfaced after a few days of completion. Atlantic and DETI would coordinate with local police departments in areas of high traffic volume to avoid traffic flow interruptions and ensure the safety of pedestrians and vehicles and passing emergency vehicles. Traffic control measures, such as flagmen and signs, would be employed as necessary to ensure safety of local traffic. Additionally, Atlantic and DETI would be responsible for restoring roads in accordance with permit conditions and as requested by landowners or agencies, and would periodically inspect roads near crossings and make repairs as necessary to damages caused by construction activities.

In a supplemental filing dated May 1, 2017, Atlantic confirmed that it has met with the VDOT to address the concerns raised in VDOT's filed comments (Accession Number 20170306-5044). Atlantic has stated that it discussed the conditions set forth by the VDOT and have affirmed Atlantic's commitment to abide by VDOT's conditions.

We received several comments on the draft EIS regarding traffic impacts on existing narrow, single-lane, unpaved roads that have been identified by Atlantic as access roads for use during construction in areas of West Virginia and Virginia. Commenters are concerned that added construction traffic (e.g., worker trips and large equipment and material delivery) would cause dangerous conditions and extensive damage. We acknowledge there may be temporary construction impacts on residences and businesses along these more narrow, rural access roads. Impacts may include inconveniences caused by noise and dust; disruption of access to homes and businesses; and traffic congestion. As mentioned previously, Atlantic and DETI would prepare spread-specific traffic and transportation management plans for managing vehicle traffic during construction of the projects to mitigate and minimize impacts.

As a result of measures and methods described in this section, we anticipate that construction activities related to ACP and SHP would result in minor and temporary to short-term impacts on transportation infrastructure.

4.9.7 Property Value and Insurance

We received numerous comments regarding the potential negative effects of ACP and SHP on property values and home insurance. Specific issues presented include devaluation of properties along and adjacent to the proposed pipeline route and project facilities, and the inability to obtain home insurance or being charged higher premiums when renewing existing policies.

An economic impact study conducted by Key-Log Economics, "*Economic Costs of the Atlantic Coast Pipeline: Effects on Property Value, Ecosystem Services, and Economic Development in Western*

and Central Virginia" (Phillips et al., 2016), analyzed the economic impact of ACP on a four-county region in western and central Virginia (Highland, Augusta, Nelson, and Buckingham Counties). The study claimed that 521 parcels in four-county region would be within the ACP right-of-way with a current total value of $277.1 million. The study cites landowners and realtors who report buyers backing out of contracts as well as notice of a general loss of interest in potentially affected properties along the proposed route of ACP (Phillips et al., 2016). Though the study presents anecdotal evidence regarding sale value of properties, unfortunately, it does not present sources for the data presented with regard to loss of property value due to proximity to a pipeline.

The Key-Log study cited an opinion survey taken of real estate agents in Wisconsin that found that 68 percent of the respondents questioned believed the presence of a pipeline on a parcel would decrease its value between 5 and 10 percent. About 70 percent of the realtors queried in that survey believed it would take longer to sell a property with a pipeline on it, then a parcel without a pipeline. Another public opinion poll in Wisconsin found that 58.9 percent of prospective property buyers would not purchase land with a pipeline on it, while 18.7 percent would only buy land encumbered by a pipeline at a reduced price (Kielisch, 2015). The responses to these polls were strictly personal opinion and not based on real estate sales data. Also, questionnaires and surveys, while providing a snapshot of public opinion, do not carry with them the rigors of statistically developed and controlled studies.

The FERC staff conducted its own independent research and found multiple studies that examined the effects of pipeline easements on sales and property values, and evaluated the impact of natural gas pipelines on real estate. One such study examined the affect a pipeline accident had on nearby property values. The study analyzed the impact that a June 1999 Bellingham, Washington gasoline pipeline explosion had on sales of real estate on or near the pipeline after the accident. The study, which considered proximity and persistence over time, found that prior to the accident there was no significant effect on property values due to proximity of the pipeline. However, immediately after the accident the study found that houses adjacent to the pipeline sold for $13,000 less than houses further away. However, over time the discount reduced back to pre-incident levels (Hansen et al., 2006).

Other studies analyzed by the FERC staff examined the impact the presence of a natural gas pipeline had on residential property values where no accidents had occurred. In 2001, the INGAA sponsored a national study to determine if the presence of a pipeline affected property values or sales prices. The study employed paired sales, descriptive statistics, and linear regression analysis to assess impacts on four separate, geographically diverse case study areas. The study found that having a pipeline on the property did not significantly alter sales prices. The size of the pipeline (diameter) had no significant impact on home prices. The study concluded that the presence of a pipeline did not impede the development of surrounding properties (Allen, Williford and Seale, Inc., 2001).

Studies conducted in 2008 by PGP Valuation Inc. (PGP) (PGP, 2008) for Palomar Gas Transmission, Inc. and by Ecowest for the Oregon LNG Project reached similar conclusions. Both studies evaluated the potential effect on property values of a natural gas pipeline that was constructed in 2003/2004 in northwestern Oregon, including along the western edge of the Portland metro area. The PGP study found that:

- there was no measurable long-term impact on property values resulting from natural gas pipelines for the particular pipeline project studied;
- interviews with buyers and brokers indicated no measurable impact on value or price; and
- there was no trend in the data to suggest an extension of marketing periods (i.e., time while the property is on sale) for properties with natural gas pipeline easements.

The Ecowest study concluded that the pipeline had no statistically significant or economically significant impact on residential properties. The study also concluded that there was no relationship between proximity to the pipeline and sale price (Fruits, 2008).

One study, *"The Effect of Pipelines on Residential Value"* (Diskin et al., 2011), looked at the effects of natural gas transmission pipelines on residential values in Arizona. The study concluded that there was no identifiable systemic relationship between proximity to a pipeline and residential sale price or value.

Another study, *"Pipeline Impact Study: Study of a Williams Natural Gas Pipeline on Residential Real Estate: Saddle Ridge Subdivision, Dallas Township, Luzerne County, Pennsylvania"* prepared by the firm of Allen, Williford and Seale, Inc., assessed the impact on the sale price of undeveloped lots and single-family residences that have a natural gas transmission line easement on the property (Allen, Williford and Seale, Inc., 2014). The report compared units in a subdivision in Luzerne County that had an existing natural gas transmission line located within it. Differences between the sale prices of undeveloped lots and houses with the pipeline easement and those that did not have an easement were analyzed. The report found that, when the sales prices of the encumbered residences were compared with the sales prices of the unencumbered residences, there was no indication that the pipeline easement had any effect on the sales prices of homes in Saddle Ridge. Likewise, when the sales prices of encumbered lots were compared with the sales prices of unencumbered lots, the differential in price could be explained by the reduction in lot size associated with the easement area.

For our analysis of the Constitution Pipeline and Wright Interconnect Projects (Docket Nos. CP13-499-000 and CP13-502-000), in Pennsylvania and New York, several appraisers were contacted about the potential impacts on property values due to the presence of a natural gas pipeline (FERC, 2014). One appraiser who teaches seminars for appraisers and realtors, including discussions of mineral rights and pipeline easements, provided information on the subject. According to the appraiser, "the empirical evidence indicates no difference in value attributable to the existence of the pipeline easement." The appraiser further noted that he was not aware of appraisers adjusting the appraiser reports for the existence of a pipeline easement. He stated that the large number of variables that impact home values make it difficult to determine the incremental effect that any one variable may have on a home's value. Regardless, it is possible that the perceived safety issues or the limitations on land use within the permanent easement could reduce the number of potential buyers for a property, which may extend the number of days a property is on the market.

In 2016, INGAA released a study conducted by Integra Reality Resources (IRR) that analyzed the impacts on property values from several FERC-jurisdictional natural gas transmission lines sited throughout the country. Case studies were analyzed from Ohio, Virginia, New Jersey, Pennsylvania, and Mississippi. The investigation focused on single-family homes and townhomes, and looked at sales prices over several years. In all case studies, sale prices were adjusted for square footage, and a linear regression model was run to determine correlations between home prices and proximity to pipeline easements. IRR found there were no statistically significant differences between prices paid within a same subdivision for houses located adjacent to a pipeline easement and houses farther away (IRR, 2016).

FERC staff also examined the impact the presence of a natural gas compressor station had on residential property values. Staff identified two recent studies that assessed the effects of natural gas pipeline compressor stations on property values. The first study was prepared for the National Fuel Gas Supply Corporation and assesses the impacts on property values in neighborhoods surrounding compressor stations in seven locations in New York state. Sales data over the previous 15 years were evaluated, and assessors from six of the seven areas were interviewed. The study found no quantifiable evidence of a discernable effect on property values or appreciation rates of properties within 0.5 mile of compressor stations. The study, which notes the general lack of sales data for analysis, identified the following

commonalities among the seven areas: the compressor stations were sited on large land parcels and set back from the road; natural and constructed buffers were utilized; and compressor station sites were generally in rural areas removed from higher density development (Griebner, 2015)

The second study, "A Study of Natural Gas Compressor Stations and Residential Property Values," prepared for Tennessee Gas Pipeline Company, L.L.C., was based on four case studies in New Hampshire and Massachusetts, compared the value of properties close to compressor stations to properties located farther away. The study relied on available market data and interviews with town assessors, building department representatives, and other government representatives. The study concluded that the presence of a compressor station did not generally affect property values in the area. The study indicated a higher confidence in this conclusion for properties more than 0.5 mile from compressor stations. The reason for this is that the areas surrounding the compressor stations in each of the case studies were more rural in nature and, therefore, there was a comparative lack of sales data in the immediate vicinity of the compressor stations as compared to the area 0.5 mile away. Overall, the study concluded that "well designed and operated compressor stations located on larger sites with adequate buffers should have minimal impact on surround land uses and residential property values" (Foster, 2016).

We recognize the studies cited above do not necessarily have a one to one applicability to all areas crossed by ACP and SHP. Most of studies that analyze the effects of pipeline easements on sales and property values have been conducted in areas with higher residential density than is found along much of the ACP and SHP project routes. The above-mentioned studies are an adequate backdrop to analyze potential impacts on property values in areas with larger populations and densities along the project routes (i.e., Harrison County, West Virginia; the Cities of Suffolk and Chesapeake, Virginia; Wilson, Johnston, and Cumberland Counties, North Carolina; and Westmoreland County, Pennsylvania). However, these findings may not be comparable when analyzing impacts on properties along pipeline rights-of-way in rural areas. This may be particularly true when analyzing large acreage parcels that may have a land use value attached to the overall value of the property, in addition to the value of the land and any structures present. We acknowledge that it is reasonable to expect that property values may be impacted differently based on the setting and inherent characteristics of the property.

Based on the research we have reviewed, however, we find no conclusive evidence indicating that natural gas pipeline easements or compressor stations would have a significant negative impact on property values, although this is not to say that any one property may or may not experience an impact on property value for either the short or long term.

We also received several comments expressing concern for potential insurance premium and mortgage rate adjustments based on pipeline proximity. Regarding the potential for insurance premium adjustments associated with pipeline proximity, insurance advisors consulted on other natural gas projects reviewed by the FERC indicated that pipeline infrastructure does not affect homeowner insurance rates (FERC, 2008). As such, we find that homeowners' insurance rates are unlikely to change due to construction and operation of the proposed ACP and SHP. Similarly, regarding the potential impacts on mortgage rates associated with pipeline proximity, our research has not found any practice by mortgage companies to re-categorize properties, nor are we aware of federally insured mortgages being revoked based on proximity to pipelines.

4.9.8 Economy and Tax Revenues

During scoping, several commenters voiced concerns regarding the negative economic effects of ACP on local areas. We also heard from many commenters who voiced concern that the economic impact studies provided by Atlantic overstated the economic impacts of the projects while ignoring any negative impacts that may occur.

Dominion Resources Services, Inc. (on behalf of Atlantic and DETI) commissioned two economic impact studies to assess the economic impact of construction and operation of ACP.[25] The first study, *The Economic Impact of the Atlantic Coast Pipeline in West Virginia, Virginia, and North Carolina*, was completed by Chmura Economics and Analytics in September, 2014.[26] The scope of the Chmura analysis covered the impacts of the construction and operation of ACP at a state level in the three-state/ commonwealth region of West Virginia, Virginia, and North Carolina.

Construction of ACP would have a beneficial, short-term impact on employment, local goods and service providers, and state governments in the form of sales tax revenues. Table 4.9.8-1 identifies the one-time direct,[27] indirect,[28] and induced[29] economic effects that construction of ACP would have on West Virginia, Virginia, and North Carolina.

TABLE 4.9.8-1

One-Time Economic Effects of Construction of the Atlantic Coast Pipeline on the Three-State/Commonwealth Region (Estimated Totals from 2014-2019) [a]

Economic Indicator	West Virginia	Virginia	North Carolina	Total for the Three-State/ Commonwealth Region
Employment [b]				
Direct	1,796	4,965	2,582	9,343
Indirect	531	1,602	812	3,380
Induced	767	2,207	1,032	4,517
Total	3,093	8,774	4,426	17,240
Spending ($ Million) [b]				
Direct	$295.9	$841.3	$409.7	$1,546.9
Indirect	$84.0	$266.1	$128.9	$551.7
Induced	$98.8	$311.5	$141.6	$639.3
Total	$478.7	$1,418.9	$680.2	$2,737.9
Tax Revenue to State Government ($ Million) [b]				
Individual Income Tax	$3.8	$14.1	$6.1	$24.0
Corporate Income Tax	$0.152	$0.528	$0.317	$0.997
Total	$4.0	$14.6	$6.4	$25.0

[a] Chmura, 2014.

[b] Numbers may not sum due to rounding.

Payroll taxes would be collected from workers employed on ACP, resulting in additional beneficial, short-term effects. Atlantic estimates that payroll spending would be approximately $1.5 billion during the

[25] Neither of the two commissioned economic analyses included county or city level analysis of impacts, nor did either study analyze economic impacts of SHP.

[26] In the final Resource Report 5, Atlantic and DETI submitted updated construction workforce and payroll numbers in the text of the resource report. Neither economic impact study was updated; therefore, the numbers presented in this section directly related to the economic impact studies do not match exactly with numbers presented in other subsections of Section 4.9. Given the relatively small difference in overall numbers, we decided that the economic impact studies were still relevant in so far as they show general impacts.

[27] Direct effects are the initial economic changes resulting from the activity or policy that takes place associated with the industry immediately affected.

[28] Indirect effects are secondary economic changes associated with the purchase of materials and supplies and services for production of ACP.

[29] Induced effects are economic changes associated with the disposable income that new workers with the ACP and linked businesses spend on household goods and services.

construction phase (of which, it is anticipated that $750 million would go to the local construction workforce) and an estimated total annual payroll of $41.3 million during operation. Atlantic estimates that approximately 13.6 percent of the total dollar amount of materials purchased would be spent on locally purchased materials in the three-state/commonwealth region.

Table 4.9.8-2 presents the estimated annual economic effects of ACP on the three-state/ commonwealth region during operation.

TABLE 4.9.8-2

Annual Economic Effects of Operation of the Atlantic Coast Pipeline on the Three-State/Commonwealth Region [a]

Economic Indicator	West Virginia	Virginia	North Carolina	Total for the Three-State/ Commonwealth Region
Employment [b]				
Direct	24	39	18	82
Indirect	26	42	18	99
Induced	24	37	16	90
Total	74	118	52	271
Spending ($ Million) [b]				
Direct	$9.4	$24.3	$7.6	$41.3
Indirect	$3.8	$7.6	$2.2	$15.3
Induced	$2.4	$5.9	$1.9	$12.6
Total	$15.6	$37.8	$11.7	$69.2
Annual Tax Revenue to State Government [c]				
Individual Income Tax	$113,678	$233,027	$71,838	$418,443

[a] Chmura, 2014.

[b] Numbers may not sum due to rounding.

[c] Corporate income tax paid by ACP to the three-state governments was not included in the Chmura analysis.

A second study, *The Economic Impacts of the Atlantic Coast Pipeline*, conducted by ICF International (ICF, 2015) assessed anticipated effects of ACP on natural gas and electricity prices as well as economic impacts on the project area. The study, which measured the net effect of energy cost savings to homes and businesses due to increased access to natural gas supplies, concluded that from years 2019 to 2038, operation of ACP could result in a net annual average energy cost savings of $377 million for natural gas and electricity consumers in Virginia and North Carolina. Additionally, the study found that the energy cost savings (due to increased supply of low-cost energy sources) could allow consumers and businesses to spend money in other parts of the economy, leading to the creation of new jobs, labor income, tax revenues, and gross domestic product.

Though an economic impact assessment was not completed specifically for SHP, it can be reasonably expected that the construction and operation of SHP would result in proportionally similar economic benefits as those of ACP in the form of increased payroll, tax revenue, purchase of local materials, and use of local vendors and businesses. DETI estimates that approximately $92 million would be spent in the SHP project area in the form of payroll to workers, and approximately $40 million (out of a total $110.1 million) would be spend in local material purchases.

Additionally, local communities in the project area would benefit from the annual property taxes that would be paid by Atlantic and DETI over the life of the projects. Table 4.9.8-3 provides the estimated annual property taxes to be paid through 2025.

TABLE 4.9.8-3

Estimated Annual Property Taxes by County/City for the Atlantic Coast Pipeline and Supply Header Project [a]

Project/Location	Estimated Property Taxes (2019)	Estimated Property Taxes (2025)	Estimated Total Taxes (2018 to 2025)
ATLANTIC COAST PIPELINE			
West Virginia			
Harrison	$30,066	$306,057	$1,889,270
Lewis	$296,286	$3,279,753	$20,219,778
Upshur	$175,622	$1,861,206	$11,481,876
Randolph	$238,669	$2,542,408	$15,683,011
Pocahontas	$152,551	$1,616,703	$9,973,526
Virginia			
Highland	$50,540	$270,916	$1,661,555
Bath	$125,667	$673,634	$4,131,461
Augusta	$369,807	$1,982,345	$12,157,901
Nelson	$234,519	$1,257,135	$7,710,121
Buckingham	$266,779	$1,430,062	$8,776,410
Cumberland	$80,951	$433,935	$2,661,366
Prince Edward	$29,209	$156,572	$960,269
Nottoway	$133,684	$716,608	$4,395,022
Dinwiddie	$110,484	$592,245	$3,632,295
Brunswick	$141,779	$760,006	$4,659,655
Greensville	$152,985	$820,072	$5,026,219
Southampton	$119,520	$640,686	$3,929,384
Suffolk, City of	$195,715	$1,049,126	$6,434,388
Chesapeake, City of	$80,211	$429,969	$2,633,865
North Carolina			
Northampton	$1,164,990	$1,993,990	$12,541,402
Halifax	$542,337	$928,008	$5,906,696
Nash	$711,671	$1,217,759	$7,750,941
Wilson	$289,257	$494,955	$3,150,350
Johnston	$1,020,271	$1,749,188	$11,130,677
Sampson	$203,882	$348,867	$2,220,513
Cumberland	$957,478	$1,638,904	$10,423,256
Robeson	$633,332	$1,084,822	$6,902,862
TOTAL	**$8,508,260**	**$30,275,934**	**$188,044,069**
SUPPLY HEADER PROJECT			
Pennsylvania [b]			
Westmoreland	NA	NA	NA
Greene	NA	NA	NA
West Virginia			
Wetzel	$652,629	$2,625,710	$14,567,100
Tyler	$21,223	$85,386	$473,712
Doddridge	$567,169	$2,281,881	$12,659,578
Harrison	$15,515	$62,420	$346,296
Marshall	$12,578	$50,607	$280,759
TOTAL	**$1,269,114**	**$5,106,004**	**$28,327,446**

[a] The property taxes identified in this table are estimates based on the currently proposed route. These estimates could change based on the final approved route.

[b] Because DETI is a public utility, property tax is assessed by the Commonwealth of Pennsylvania through the Public Utility Realty Act (PURTA). DETI would be subject to PURTA taxes which would then be distributed to local tax jurisdictions in the Commonwealth based on various parameters.

We received comments that the two economic impact studies commissioned by Atlantic and DETI were inadequate and did not accurately capture the positive and negative economic impacts of the construction and operation of ACP. One of these comments included a study conducted by Key-Log Economics on behalf of Friends of Nelson County, titled *Economic Costs of the Atlantic Coast Pipeline: Effects on Property Values, Ecosystem Services, and Economic Development in Western and Central Virginia* (Phillips et al., 2016). The study, focused on Nelson County, Virginia and identified economic impacts on land value, natural benefits, and economic sectors. As discussed in section 4.9.7, we find no conclusive evidence indicating that natural gas pipeline easements would have a negative impact on property values. Additionally, Nelson County would receive positive economic impacts in the form of direct, indirect, and induced spending during construction of ACP. Finally, Atlantic would pay approximately $7.7 million in property taxes to Nelson County from the years 2019 to 2025.

We received comments on the draft EIS from several local business owners concerned that construction of ACP and SHP would negatively impact their businesses and may, in some instances force them to close. We acknowledge that businesses may be directly and indirectly impacted by the projects; however, overall, the economic effects resulting from construction of ACP and SHP would be beneficial at the state, local, and county levels in the form of increased sales and payroll taxes. In the short-term, the projects would create economic stimulus to the affected areas via payroll and materials expenditures and sales taxes. Atlantic and DETI would purchase goods, materials, and services locally when possible. Workers on both projects would also most likely spend a portion of their pay in local communities on items such as housing, food, automobile expenses, entertainment, and miscellaneous other items.

Additionally, we received comments that the project would cause a delay or potentially prevent two large projects from being developed in the Rockfish Valley area. The first is the development of a self-described luxury hotel at Wintergreen Resort. The proposed hotel would consist of 150 rooms and is estimated to produce $8.5 million to $12 million in annual revenues and contribute 150 permanent, full-time jobs, plus seasonal jobs to the local economy (Friends of Wintergreen, 2016). Based on information provided from the developers, Wintergreen Pacific LLC and Pacific Group Resorts, developers "would be forced to discontinue development of [the] hotel, or substantially delay its development" if ACP is constructed (Friends of Wintergreen, 2016). Based on information provided by Wintergreen Property Owners Association Inc. and Wintergreen Resort Inc., the hotel would be located over 1 mile east of the project near AP-1 MPs 159.0 to 160.0. Concerns include blocking access along Beech Grove Road leading to the resort area and hindering future development and sale of lots. Commenters speculated that if the hotel at Wintergreen Resort was not developed the value of the existing resort would diminish, impacting the future viability of the resort. Wintergreen Resort is cited as the largest employer in Nelson County, and commenters speculated that any diminishing value or opportunities for the resort could cause negative economic impacts for the entire Rockfish Valley area and the county, including the loss of property values if Wintergreen Resort folded (Friends of Wintergreen, 2016).

The second development is the Spruce Creek Resort and Market, a proposed five-star destination resort, hotel, restaurant, and public market on 100 acres of mature woodland along Virginia State Route 151 and bisected by Spruce Creek. According to developers, the development has the potential to create 100 permanent, full-time jobs, plus seasonal jobs and is estimated to produce $15 million to $20 million in annual revenue (Friends of Wintergreen, 2016). Specifically, the developer is concerned that ACP would cross the middle of the property, eliminating the attractiveness of the resort area and, thus, development of the resort would be stopped. Based on information provided by the developer, the AP-1 mainline would cross the resort between approximate MPs 162.4 and 162.7 in Nelson County, Virginia.

We believe that construction of ACP and development of the hotel at Wintergreen Resort and the development of Spruce Creek Resort and Market could be accomplished such that impacts associated with

ACP are reduced or mitigated for, while maintaining the appeal of the area, as demonstrated by other residential and commercial developments in the area and similar projects throughout the country.

4.9.9 Environmental Justice

EO 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations,* requires federal agencies to consider if impacts on human health or the environment (including social and economic aspects) would be disproportionately high and adverse for minority and low-income populations and appreciably exceed impacts on the general population or other comparison group. We received comments expressing concern that ACP and SHP pipeline and aboveground facilities were sited through areas with disproportionately high concentrations of low-income and minority populations, thus unduly impacting these environmental justice communities.

Consistent with EO 12898, the CEQ called on federal agencies to actively scrutinize the following issues with respect to environmental justice (CEQ, 1997a):

- the racial and economic composition of affected communities;
- health-related issues that may amplify project effects on minority or low-income individuals; and
- public participation strategies, including community or tribal participation in the process.

The EPA's Environmental Justice Policies focus on enhancing opportunities for residents to participate in decision making. The EPA (2011) states that Environmental Justice involves meaningful involvement so that: "(1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contributions can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision-making process; and (4) the decision-makers seek out and facilitate the involvement of those potentially affected."

In accordance with EO 12898, all public documents, notices, and meetings for ACP and SHP were made readily available to the public during our review of the project. Atlantic and DETI met with many different stakeholders during the initial development of the route, including local residents and affected landowners. These efforts involved several open houses with the affected communities and local authorities. Atlantic and DETI also established, and are maintaining, a project website to share project information with the public.

Atlantic and DETI also used the FERC's Pre-filing Process (see section 1.3). One of the major goals of this process is to increase public awareness and encourage public input regarding every aspect of the project (e.g., design, routing, environmental concerns and impacts) before an application is filed. As part of this process, FERC staff participated in several of Atlantic's and DETI's open houses and hosted several FERC scoping meetings to receive input from the public about ACP and SHP. Interested parties have had, and will continue to be given, opportunities to participate in the NEPA review process. To date, this included the opportunity to participate in the public scoping meetings within the project area to identify concerns and issues that should be covered in the EIS, and the opportunity to submit written comments about the projects to the FERC. Stakeholders will also have the opportunity to review this draft EIS and provide comments directly to the FERC staff in person (during scheduled comment sessions) or in writing.

4.9.9.1 Demographic and Economic Data

Based on published EPA guidance concerning environmental justice reviews (EPA, 1998), we used a three-step approach to conduct our review. These steps are:

1. Determine the existence of minority and low-income populations.
2. Determine if resource impacts are high and adverse.
3. Determine if the impacts fall disproportionately on environmental justice populations.

For the purposes of this review, a low-income population exists when the percentage of all persons living below the poverty level is more than the percentage for the state where the census tract is located. Also, for the purpose of this review, minority population exists when:

1. the total racial minorities in a U.S. Census Bureau-defined census tract (U.S. Census Bureau, 2013) are more than 50 percent of the tract's population;

2. the percentage of a racial minority in a census tract is "meaningfully greater"[30] than in the comparison group;

3. the total ethnic minorities in a census tract are more than 50 percent of the tract's population; or

4. the percentage of ethnic minorities in a census tract is meaningfully greater than in the comparison group.

Racial and ethnic minorities include: African American/Black, Native American or Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, two or more races, and other races; and the Hispanic or Latino ethnicity.

Appendix U provides an overview of the racial and economic characteristics of the population within the 136 unique census tracts within a 1-mile radius of all ACP and SHP facilities (this includes the pipeline, compressor stations, all aboveground facilities, and contractor yards). In West Virginia, minorities comprise 6.4 percent of the total population. The percentage of minorities in the West Virginia census tracts within 1 mile of ACP or SHP ranges from 0.1 to 6.9 percent. No census tracts within 1 mile of ACP or SHP have a minority population greater than 50 percent or meaningfully greater than that of the county in which it is located. In Virginia, minorities comprise 30.8 percent of the total population. The percentage of minorities in the Virginia census tracts within 1 mile of ACP ranges from 0.2 to 100 percent. In 15 of the 63 census tracts, the minority population is greater than 50 percent or meaningfully greater than that of the county in which it is located. In North Carolina, minorities comprise 30.5 percent of the total population. The percentage of minorities in the North Carolina census tracts within 1 mile of ACP ranges from 12.5 to 95.5 percent. In 20 of the 42 census tracts, the minority population is greater than 50 percent or is meaningfully greater than that of the county in which it is located. In Pennsylvania, minorities comprise 18.1 percent of the total population. The percentage of minorities in the Pennsylvania census tracts within 1 mile of SHP ranges from 0.1 to 42.8 percent. In one of the nine census tracts, the minority population is meaningfully greater than that of the county in which it is located.

To restate, for this analysis, a low-income population exists when the percentage of all persons living below the poverty level is greater than the percentage of persons below poverty level for the state

[30] "Meaningfully greater" is defined in this analysis when minority or ethnic populations are at least 10 percentage points more than in the comparison group, which was the county in which the census tract was located.

where the census tract is located. In West Virginia, 18.1 percent of all persons live below the poverty level. Nine of the 22 census tracts in West Virginia within a 1-mile radius of ACP and SHP project facilities have a higher percentage of persons living below the poverty level when compared to the state. In Virginia, 11.5 percent of all persons live below the poverty level. Thirty-four of the 63 census tracts in Virginia within a 1-mile radius of ACP facilities have a higher percentage of persons living below poverty-level when compared to the state. In North Carolina, 17.6 percent of all persons live below the poverty level. Twenty-seven of the 42 census tracts in North Carolina within a 1-mile radius of ACP facilities have a higher percentage of persons living below poverty-level when compared to the state. In Pennsylvania, 13.5 percent of all persons live below the poverty level. No census tracts within 1 mile of SHP project facilities have a low-income population meaningfully greater than that of the state.

We received numerous comments on the draft EIS expressing concern about minority and low-income communities near the proposed Compressor Station 2 in Buckingham County, Virginia. Using the methodology described above, we determined that the proposed Compressor Station 2 would be within a census tract that is designated a low-income environmental justice population. The two other census tracts within 1 mile of the proposed Compressor Station 2 are also designated low-income environmental justice populations. None of the three census tracts within 1 mile of the proposed Compressor Station 2 are designated minority environmental justice populations based on the methodology described above. The nearest residence to the proposed Compressor Station 2 is approximately 1,450 feet from the site.

The construction and operation of the proposed facilities would affect a mix of racial/ethnic and socioeconomic areas in the ACP and SHP project area. Not all impacts identified in this EIS are considered to affect minority or low-income populations. The primary adverse impacts on the environmental justice communities associated with the construction of ACP and SHP would be the temporary increases in dust, noise, and traffic from project construction. These impacts would occur along the entire pipeline route and in areas with a variety of socioeconomic backgrounds.

Due to the number of comments we received regarding environmental justice and specifically impacts resulting from increased air and noise emissions at the proposed Compressor Station 2, we have expanded our discussion of the potential for the risk of impacts to fall disproportionately on environmental justice communities. Risk is defined as the likelihood and probability for experiencing an impact, in this case negative health outcomes from adverse project impacts. The approach to determining disproportionality in this impact assessment was done by considering the risk for environmental justice populations to experience negative health outcomes that could result from increased air emissions and noise.

As discussed in section 4.11.1, air pollutants associated with ACP and SHP include increased dust as a result of construction equipment and vehicles, and compressor station emissions, which include carbon monoxide (CO), carbon dioxide (CO_2), methane, and nitrous oxide (NO_x); volatile organic compounds (VOCs); and particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$). These air pollutants are known to increase the effects of asthma[31] and may increase the risk of lung cancer (Nafstad et al., 2003).

Due to high rates of asthma within the overall African American community, we consider this community especially sensitive. Based on American Lung Association statistics, "African Americans have one of the highest rates of current asthma compared to other racial/ethnic groups" (American Lung

[31] Asthma is a chronic disorder impacting the lung airways where periods of reversible airflow obstruction is experienced. Individuals experience asthma "episodes" or "attacks" from a variety of events including exercise, airway infections, airborne allergens, occupational exposures, and air pollutions such as particulate matter and VOCs. Asthma is incurable but controllable though appropriate medical care with medication and avoiding exposures to triggers for attacks (Center for Disease Control and Prevention, 2013).

Association, 2010). Prevalence rates are consistently high between African Americans and Caucasians in all age groups (American Lung Association, 2010). African American, multi-race, and adult females aged 18-24 have the highest adult prevalence of asthma. Prevalence in children is highest in African Americans when compared to other racial/ethnic groups (Centers for Disease Control and Prevention [CDC], 2013).

When considering the health impacts associated with compressor station emissions, increased rates of lung cancer were identified associated with the compounds emitted by compressor station operations (Nafstad et al., 2003). Studies have shown that several different cancer-related compounds and chemicals are present in the air in proximity to construction and operation of compressor stations, and that some of these have documented health effects on the general and vulnerable populations (Southwest Pennsylvania Environmental Health Project, 2015).

As noted previously, African American populations have a greater prevalence of asthma. Thus, it is reasonable to assume that, where African American populations exceed the thresholds for environmental justice populations identified in this analysis, those populations have an increased risk over Caucasian populations (and therefore disproportionate) of experiencing adverse effects from decreased air quality. Further, it is recognized that low income populations have greater risks associated with negative health outcomes (CDC, 2017).

The proposed new and modified compressor stations would be gas-driven; air quality impacts and mitigation measures associated with compressor station operation are discussed in section 4.11.1. Health risks related to ACP and SHP would be associated with an unanticipated pipeline or compressor station failure, gas leaks, and blowdowns at compressor stations. Section 4.12 describes the risks to public safety that could result from a pipeline failure and describes how applicable safety regulations and standards would minimize the potential for these risks. Because the projects would generally traverse rural areas, the number of persons who would be at risk of injury due to a pipeline failure would be low, and there is no evidence that such risks would be disproportionately borne by any racial, ethnic, or socioeconomic group.

Atlantic and DETI would implement a series of measures that would minimize potential impacts on the nearby communities, including environmental justice communities near project facilities. For instance, Atlantic and DETI propose to employ proven construction-related practices to control fugitive dust, such as application of water or other commercially available dust control agents on unpaved areas subject to frequent vehicle traffic. Some individuals with extreme sensitivity to changes in air quality could be impacted by temporary fugitive dust during construction or air emissions from the compressor stations. However, not all individuals within the identified and surrounding environmental justice populations would be impacted.

Similarly, noise control measures would be implemented by Atlantic and DETI during construction and operation of the projects. Additionally, Atlantic and DETI (per their proposed mitigation measures and our additional recommendations) would ensure that the operational noise attributable to the new compressor stations and compressor station modifications would be less than 55 L_{dn} at nearby NSAs, and the increase in the overall noise due to the new stations would be below the threshold considered perceptible to the human ear at most NSAs.

Due to construction dust and compressor station emissions, African American populations near ACP and SHP could experience disproportionate health impacts due to their susceptibility to asthma. Health impacts from construction dust would be temporary, localized, and minor. Health impacts from compressor station emissions would be moderate because, while they would be permanent facilities, air emissions would not exceed regulatory permittable levels. As a result, no disproportionately high and adverse impacts on environmental justice populations as a result of air quality impacts, including impacts associated with the proposed Compressor Station 2, would be expected as a result of ACP and SHP. Also,

no disproportionately high and adverse impacts on environmental justice populations as a result of other resources impacts would be expected.

4.9.10 Socioeconomics on Federal Lands

ACP's AP-1 mainline would cross approximately 21.2 miles of NFS lands and 0.1 mile of NPS-owned land (associated with the BRP). Table 4.8.9-1 identifies the location and distance of crossings of ACP over federal lands.

The socioeconomic data for the counties crossed by ACP where federal lands are located (Pocahontas, West Virginia for the MNF; Highland, Bath, and Augusta Counties, Virginia for the GWNF; and Augusta and Nelson Counties, Virginia for the BRP) are presented in the tables throughout section 4.9. Information regarding specific recreational and special interest areas on federal lands are discussed in detail in section 4.8.9.

4.9.10.1 Recreation and Tourism

Potential visual impacts of ACP on federal lands as it relates to recreation are discussed in detail in section 4.8.9. There are a wide variety of recreational activities that take place on federal lands that would be crossed by ACP. As further described in section 4.8.9, we do not believe construction and operation of ACP would have a significant adverse effect on recreation on federal lands. There is a possibility of conflict between pipeline construction traffic and visitors using roads on federal lands, particularly during peak tourism season (see section 4.9.10.2). Additionally, due to the influx of non-local construction workers to the project area, there may be increased competition (and cost) for short-term housing, which may decrease housing availability for tourists and recreationalists near federal lands. However, given the sufficient amount of short-term housing available in the entire ACP and SHP project area and surrounding metropolitan statistical areas, we do not believe the construction of ACP would create a significant adverse impact on visitors looking for accommodations during trips to federal lands.

4.9.10.2 Transportation and Traffic

Pipeline construction would require the use of several existing roads and the construction of new access roads on FS land to access the pipeline right-of-way during construction and operation (see table 4.8.9-3). Access road construction activities would affect public access. To minimize and mitigate potential impacts, Atlantic would prepare spread-specific traffic and transportation management plans for managing vehicle traffic during construction of ACP, considering peak travel times, emergency services, and visitor traffic. The FS has stated traffic and transportation impacts on NFS lands cannot be fully assessed until spread-specific plans are provided.

4.10 CULTURAL RESOURCES

Section 106 of the NHPA, as amended, requires the FERC, as lead federal agency, and the cooperating agencies to consider the effect of their undertakings on properties listed in or eligible for listing in the NRHP and to afford the ACHP an opportunity to comment. Atlantic and DETI, as non-federal parties, provided us with information, analyses, and recommendations, in accordance with the ACHP's regulations for implementing section 106 at 36 CFR 800.2(a)(3), and the FERC's regulations at 18 CFR 380(f). The federal land managing agencies have obligations regarding cultural resources under other federal laws and regulations, including the Federal Land Policy and Management Act, the Antiquities Act of 1906, section 110 of the NHPA, the Archaeological and Historic Preservation Act of 1974, the Archaeological Resources Protection Act (ARPA) of 1979, and the Native American Graves Protection and Repatriation Act.

Construction and operation of ACP and SHP could adversely affect historic properties (i.e., cultural resources listed or eligible for listing in the NRHP). These historic properties could include prehistoric or historic archaeological sites, districts, buildings, structures, and objects, as well as locations with traditional value to Native Americans or other groups. Such historic properties generally must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and must meet one or more of the criteria specified in 36 CFR 60.4. Direct effects could include destruction or damage to all, or a portion, of an historic property. Indirect effects could include the introduction of visual, atmospheric, or audible elements that affect the setting or character of a historic property. Atlantic's and DETI's inventory of cultural resources sites within the projects' area of potential effects (APE), and recommendations of their eligibility for listing in the NRHP, is presented below.

If a historic property would be adversely affected by the projects, avoidance or other mitigation would be proposed. Avoidance might include, but would not be limited to, realignment of the pipeline route, relocation of temporary workspace, use of boring, or changes in the construction and/or operational design. Mitigation might include the systematic professional excavation of an archaeological site, the preparation of photographs and/or measured drawings documenting standing structures or other historic features, or the use of landscaping or other techniques that would minimize or eliminate effects on the historic setting or ambience of standing structures or other resources.

4.10.1 Cultural Resources Investigations

In the NOI, the FERC stated that the APE for natural gas facility projects encompasses at a minimum all areas subject to ground disturbance (examples include construction right-of-way, contractor/pipe storage yards, compressor stations, and access roads). Project-specific APEs were developed for archaeological and historic architecture surveys according to the guidelines and requirements for each state.

4.10.1.1 Atlantic Coast Pipeline

ACP is in West Virginia, Virginia, and North Carolina. The ACP route crosses the MNF in West Virginia and the GWNF in Virginia. Atlantic consulted with the FS and prepared separate survey reports for each of the national forests. The cultural resources studies for federal lands, which include the MNF, GWNF, and the BRP, are discussed in section 4.10.6.

Atlantic contracted with ERM (formerly Natural Resource Group, LLC) to assist with the cultural resources investigations for ACP. Atlantic described the APE for direct project effects as the construction footprint where ground-disturbing activities are possible. Atlantic surveyed a 300-foot-wide linear corridor for the pipeline, a 50-foot-wide corridor for access roads, and the footprint for off-corridor facilities and extra workspaces. Atlantic described the APE for historic architecture (above ground) resources as the area for direct effects plus the surrounding areas within view of new construction, or changes to the landscape. The size of this APE varied according to the topography and surroundings, and was expanded in some locations during the project to address agency requirements.

Atlantic conducted surveys for the original route, reroutes, and smaller route adjustments. This discussion addresses only the cultural resources within the current APE. Atlantic has completed cultural resources surveys of approximately 98 percent of the proposed project facilities, leaving 2 percent of the project workspace remaining to be surveyed.

Surveys, reporting, and NRHP determinations are not complete for cultural resources along ACP. Atlantic continues to conduct reconnaissance surveys for those areas not yet surveyed, and has begun evaluative testing for sites in the APE that cannot be avoided. Atlantic would file with us reports on surveys

and evaluative testing as they are prepared, and will continue to consult with the relevant SHPOs and other stakeholders regarding site significance, as well as evaluative testing plans, treatment plans, and mitigation of adverse effects on historic properties.

West Virginia

In West Virginia, Atlantic submitted separate reports for archaeology and historic architecture surveys. As described in section 2.1, the portion of ACP in West Virginia includes a portion of the AP-1 mainline, two new M&R stations, one pig launcher, and a newly proposed Compressor Station 1 (in Lewis County), as well as various valves that would be installed within the pipeline right-of-way. The project in West Virginia as currently designed would also include three new communication towers, two cathodic protection groundbeds, and off-corridor yards and access roads.

Atlantic conducted surveys of 98.7 percent of all pipeline facilities and 75 percent of the locations of microwave towers for direct impacts (archaeological resources), and 100 percent of all project locations for historic architectural resources (above ground resources). To date, landowners have not granted access to a small number of unsurveyed parcels. In addition to surveying the majority of the AP-1 mainline, Atlantic surveyed Compressor Station 1 and all aboveground facility locations, as well as five contractor yards, three pipe yards, three water impoundment areas, and multiple access roads. Surveys have not yet been completed along a portion of the AP-1 mainline and access roads, and the locations of microwave towers. In addition, Atlantic has not reported on the complete surveys of cathodic protection groundbeds.

Atlantic reports that 20 cultural sites that are recommended eligible for listing on the NRHP are unevaluated for eligibility and treated as eligible, or are cemeteries in the APE in West Virginia; 14 are historic standing structures or linear resources, and 1 is an archaeological site. There are also five stand-alone cemeteries (three additional cemeteries are associated with standing structures). Atlantic archaeologists did not identify any locations in West Virginia that required deep testing for possible deeply buried archaeological sites.

Atlantic's contractor ERM submitted one report and four addenda for archaeological resources to the West Virginia Division of Culture and History (WVDCH).[32] Atlantic's contractor Dovetail Cultural Resources Group submitted an initial historic architecture survey report and two addenda. ERM produced a third, fourth, and fifth historic architecture survey report addenda that documented the re-survey of portions of the APE, along with survey of new locations of the APE. In these reports, ERM made recommendations for eligibility, and committed to preparing a supplemental report that will summarize the work completed to date and identify the potential historic properties that remain in the West Virginia APE.

ERM conducted Phase II testing at one additional site (46PH775) and recommended that the site is not eligible for listing on the NRHP. This was the only archaeological site recommended for evaluative testing in West Virginia. The WVDCH commented that because only the portion of the site in the APE was evaluated, the NRHP status of the site should remain unevaluated. The agency agreed that the portion within the APE lacks research potential and construction here will not have adverse effect on 46PH775.

[32] The West Virginia Division of Culture and History serves as the West Virginia SHPO.

The WVDCH reviewed and provided comments on archaeology and historic architecture reports. The agency has reviewed four archaeological reports and concurred with Atlantic's findings. The agency provided comments on six historic architecture reports, and noted that it is waiting for the ERM comprehensive report on all historic architecture properties in the APE. Atlantic also submitted a report of the additional survey and delineation of the five standalone cemeteries in West Virginia. Table 4.10.1-1 summarizes the cultural sites identified to date in the APE in West Virginia that are recommended eligible or potentially eligible for listing in the NRHP, are unevaluated for eligibility, or are cemeteries that would be avoided during construction. The table is based on numerous reports and other filings, and is the best data currently available. It is subject to changes while adjusting the project route and workspace and additional cultural resources investigations.

In a February 2016 letter to the WVDCH, Ms. April Keating asked about seven properties near the project in Upshur County. Ms. Keating asked why the sites were not included in Atlantic's historic architecture survey report. In follow-up correspondence, Atlantic explained that four of the sites were not in the project APE; one site was previously recorded and determined not eligible; one site was built after 1967 and was less than 50 years old; and the final site, the Simmons Cemetery (46UP331), was recorded for this project.

Several landowners commented that cultural resources sites, including historic cemeteries, may be affected by ACP in West Virginia. Atlantic would be required to complete surveys and evaluate the significance of cultural sites within the APE prior to construction (see section 4.10.7). State and local laws protect cemeteries and burials from disturbance. Atlantic conducted additional survey at five cemeteries and submitted a cemetery delineation report. Atlantic would file treatment plans identifying methods (e.g., fencing, vegetation buffers) to avoid impacts on cemeteries during construction. In addition, avoidance measures would be depicted on construction alignment sheets.

Civil War Battlefields

We received several comments regarding possible impacts on Civil War sites and other potential historic properties near Valley Mountain and Mingo Flats in West Virginia. We also received comments about project effects on historic sites associated with Cheat Mountain. Subsequent to these comment submissions, Atlantic incorporated route alternatives to avoid historic sites near these locations in West Virginia, including the Cheat Mountain Battlefield.

Virginia

In Virginia, Atlantic submitted survey reports for archaeology and separate reports for historic architecture. As described in section 2.1, the portion of ACP in Virginia includes part of the AP-1 mainline and AP-3 lateral, all the AP-4 and AP-5 laterals, Compressor Station 2 (in Buckingham County), 4 M&R stations, 7 pig launcher/receiver facilities, 10 cathodic protection groundbeds, 16 communication towers, and numerous off-corridor contractor yards and access roads. Atlantic reported that they have completed the survey of 98.4 percent of the direct impact APE for all project facilities, and 100 percent of the APE for historic architecture resources in Virginia. Atlantic would survey and report on the remaining 1.6 percent of the APE for direct effects that has not been surveyed.

TABLE 4.10.1-1

National Register of Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in West Virginia

Site Name and Number	County	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Response
LE-0004/ 46LE61 Broad Run Baptist Church and Cemetery	Lewis	Historic Church and Cemetery	Avoid	Eligible	Concur; cemetery treatment plan pending
HS-0884/ 46HS121 Mount Lebanon Cemetery	Harrison	Historic Church and Cemetery	Avoid cemetery	Not Eligible	Pending; Requested more information; cemetery treatment plan pending
PH-0037-0058	Pocahontas	Historic Railroad	Avoid by drilling	Eligible	Concur
PH-0037-64	Pocahontas	House	Avoid or mitigate	Eligible	Pending additional information
PH-0037-65	Pocahontas	Historic Commercial	Avoid or mitigate	Eligible	Pending additional information
PH-0095	Pocahontas	Historic Structure	Avoid or mitigate	Eligible	Concur
PH-0092	Pocahontas	Historic CCC Trail	Avoid or mitigate	Eligible	Concur
PH-0461	Pocahontas	House	Avoid or mitigate	Eligible	Pending additional information
PH-0471	Pocahontas	House	Avoid or mitigate	Eligible	Concur
PH-0902	Pocahontas	Historic Railroad	Avoid or mitigate	Eligible	Concur
PH-0903	Pocahontas	House	Avoid or mitigate	Eligible	Concur
PH-0954	Pocahontas	Barn	Avoid or evaluate	Not Eligible	Pending additional information
UP-0113/ 46UP348	Upshur	Historic Church and Cemetery	Avoid or Mitigate	Eligible	Pending additional information; cemetery treatment plan pending
46PH775	Pocahontas	Prehistoric and Historic	None	Not Eligible in APE	Revised to Unevaluated; No Adverse Effect in APE
46PH779	Pocahontas	Historic Cemetery	Avoid	Not Eligible	Concur; cemetery treatment plan pending
46PH790	Pocahontas	Historic Cemetery	Avoid	Not Eligible	Pending; cemetery treatment plan pending
46UP319	Upshur	Historic Cemetery	Avoid	Not Eligible	Concur; cemetery treatment plan pending
46RD722	Upshur	Historic Cemetery	Avoid	Not Eligible	Concur; cemetery treatment plan pending
46UP331 / Simmons Cemetery	Upshur	Historic Cemetery	Avoid	Not Eligible	Concur; cemetery treatment plan pending
UP-0825	Upshur	House	Avoid or Evaluate	Unevaluated	Pending
UP-0830 WWII Training Airfield	Upshur	Structures	None; no adverse effect	Eligible	Concur

In Virginia, Atlantic surveyed its originally proposed route, as well as subsequent reroutes, and route variations. The few parcels that have not been surveyed are waiting for landowner permission to enter. Atlantic completed the historic architecture surveys for all facilities in Virginia, and completed archaeological survey of 98.9 percent of the pipeline corridor, 94 percent of access routes, Compressor Station 2, M&R stations, pig launcher/receiver facilities, cathodic groundbeds, contractor yards and microwave tower locations. The remaining parcels will be surveyed when access to enter has been granted.

Atlantic recorded 110 cultural resources sites in the current APE that are potentially eligible for listing in the NRHP or have not been evaluated for listing, or are cemeteries that are protected by state laws. Of the 110 sites, 22 are archaeological sites, 71 are historic architecture sites (8 including cemeteries), and 17 are cemeteries. Of the 22 archaeological sites, 21 date to the prehistoric period (4 also have historic components), and 1 site has an unknown temporal or cultural component. Of the 71 historic architecture sites, 6 are Civil War battlefields, 46 are standing structures (domestic or commercial), 5 are historic districts or landscapes (including the BRP, which is also a linear resource), and 5 are linear resources (including railroads, the ANST, and the Dismal Swamp Canal), and 8 are structures that include cemeteries (7 associated with churches and 1 with a house). One historic architecture site has an unknown temporal or cultural component. Atlantic conducted systematic metal detecting over the battlefields in the APE in Virginia; these surveys did not identify archaeological evidence of Civil War activity.

Geomorphological investigations identified five locations in Virginia that may contain deeply buried living surfaces. Atlantic conducted deep testing using deep auger probes and mechanical excavation at the five locations and identified one archaeological site (44GV0402), which Atlantic recommends as not eligible for NRHP listing. We have not received SHPO comments on these findings and eligibility recommendations.

Atlantic's contractor ERM submitted an initial archaeology report and four addenda for the APE in Virginia to the VDHR[33] for its review. The agency concurred with most of Atlantic's findings and recommendations, except for three sites that required further evaluation. In addition, Atlantic's contractor Dovetail Cultural Resources Group prepared an initial historic architecture survey report and two addenda. ERM produced a third addendum that documented the re-survey of portions of the APE, along with survey of new locations of the APE. In this third addendum, ERM made recommendations for eligibility and additional work, and committed to preparing a supplemental report that will summarize the work completed to date, and identify those historic architecture resources that remain in the APE. ERM submitted a fourth, fifth, and sixth addendum historic architecture survey report. The VDHR reviewed six historic architecture reports and concurred with most of the reports' findings. The agency did not concur with eligibility recommendations for four properties, and asked for additional information before commenting on several other properties. The VDHR comments on historic architecture report addenda 5 and 6 are pending.

ERM conducted Phase II testing at 19 archaeology sites, and recommended that 13 sites are not eligible, or the portion of the site in the APE is recommended not eligible for the NRHP. ERM recommended that 6 sites are eligible for listing. VDHR comments regarding Atlantic's recommendations after Phase II testing are pending.

Table 4.10.1-2 summarizes the cultural resources identified to date in Virginia that are listed or recommended eligible for listing, are not evaluated for eligibility, or are cemeteries that would be avoided during construction. The table is based on numerous reports and other filings, and is the best data currently available. It is subject to changes while adjusting the project route and workspace, and completion of additional cultural resources investigations.

[33] The VDHR serves as the Virginia SHPO.

TABLE 4.10.1-2

National Register of Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in Virginia

Site Name and Number	County/City	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
44AU0024	Augusta	Prehistoric and Historic	Avoid or Mitigate	Eligible after testing	Pending after testing
44AU0870	Augusta	Prehistoric	Avoid or Evaluate	Unevaluated	Potentially Eligible
44AU0907	Augusta	Prehistoric	Avoid or Mitigate	Eligible after testing	Pending after testing
44AU0918	Augusta	Prehistoric	Avoid or Evaluate	Unevaluated	Pending
44AU0781	Augusta	Prehistoric	Avoid or Evaluate	Unevaluated	Pending
44AU0917	Augusta	Prehistoric	Avoid or Evaluate	Unevaluated	Pending
44AU0924	Augusta	Prehistoric	Avoid or Evaluate	Not Eligible after testing	Pending
44BK0366	Buckingham	Historic Cemetery	Avoid	Not Eligible	Potentially Eligible
44BK0386	Buckingham	Historic Cemetery	Avoid	Not Eligible	Pending
44BR0340	Brunswick	Historic Cemetery	Avoid	Unknown	Pending
44BR0349	Brunswick	Prehistoric and Historic	Avoid or Evaluate	Not Eligible after testing	Pending
44DW0451	Dinwiddie	Prehistoric	Avoid or Evaluate	Unevaluated	Potentially Eligible
44NE0197	Nelson	Historic Cemetery	Avoid	Unknown	Pending
44GV0373	Greensville	Prehistoric	Avoid Impacts by Using Mats	Unevaluated	Potentially Eligible
44GV0388	Greensville	Prehistoric	Avoid outside of APE	Unevaluated; Not Eligible in APE	Pending after testing
44GV0394	Greensville	Historic Cemetery	Avoid	Not Eligible	Pending; cemetery treatment plan pending
44GV0400	Greensville	Historic Cemetery	Avoid	Not Eligible	Pending; cemetery treatment plan Pending
44NT0312	Nottoway	Historic Cemetery	Avoid	Unknown	Pending; cemetery treatment plan Pending
44NT0313	Nottoway	Historic Cemetery	Avoid	Not Eligible	Concur; treatment plan pending
44SN0308	Southampton	Prehistoric	Avoid or Mitigate	Eligible after testing	Pending after testing
44SN0311	Southampton	Prehistoric	Avoid Impacts by using mats	Unevaluated	Potentially Eligible
44SN0335	Southampton	Unknown	Avoid or Evaluate	Unevaluated	Potentially Eligible

TABLE 4.10.1-2 (cont'd)

National Register or Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in Virginia

Site Name and Number	County/City	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
44SN0336	Southampton	Historic Cemetery	Avoid	Unknown	Not Eligible; cemetery treatment plan pending
44SN0342	Southampton	Prehistoric	Avoid	Unevaluated; Not Eligible in APE	Pending after testing
44SN0384	Southampton	Prehistoric	Avoid	Unevaluated; Not Eligible in APE	Pending after testing
44SK0013	Suffolk	Prehistoric	Avoided by HDD	Unevaluated	Potentially Eligible
44SK0585	Suffolk	Prehistoric	Phase II ongoing	Unevaluated	Potentially Eligible
44SK0080/ 44SK0608 (sites combined after testing)	Suffolk	Prehistoric and Historic	Avoid or Mitigate	Eligible	Pending after testing
44SK0340	Suffolk	Historic Cemetery	Avoid	Not Eligible	Concur; cemetery treatment plan pending
44SK0586	Suffolk	Historic Cemetery	Avoid	Not Eligible	Concur; cemetery treatment plan pending
44SK0591	Suffolk	Prehistoric	Avoid or Evaluate	Unevaluated	Potentially Eligible
44SK0612	Suffolk	Historic and Prehistoric	Avoid or Mitigate	Eligible	Pending
44CS0346	Chesapeake	Prehistoric	Avoid or Mitigate	Eligible	Pending
045-0007	Highland	House	Avoid or Mitigate	Eligible	Pending, requested Phase II survey
007-0015/ Folly Farm	Augusta	Historic Farmstead	Avoid or Mitigate	Listed	NA
007-0103	Augusta	House	Avoid or Mitigate	Eligible	Concur
007-0442	Augusta	Historic Farmstead	Avoid or Mitigate	Eligible	Pending
007-0445	Augusta	Historic Cemetery	Avoid	Not Eligible	Cemetery treatment plan pending
007-0447	Augusta	Historic Hall-Parlor	Avoid or Mitigate	Eligible	Concur
007-0463	Augusta	House	Avoid or Mitigate	Eligible	Concur
007-0272	Augusta	Unknown	Avoid or Mitigate	Eligible	Pending
007-0476	Augusta	Hoy's Store and P.O.	Avoid or Mitigate	Eligible	Concur
007-0487	Augusta	House	Avoid or Mitigate	Eligible	Concur
007-0480	Augusta	House	Avoid or Evaluate	Unevaluated	Concur, but requested more information
007-0490	Augusta	House	Avoid or Mitigate	Eligible	Does not Concur
007-5728	Augusta	House	Avoid or Mitigate	Eligible	Does not Concur

TABLE 4.10.1-2 (cont'd)

National Register or Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in Virginia

Site Name and Number	County/City	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
007-0863	Augusta	Historic Church and Cemetery	Avoid or Mitigate	Eligible	Concur; cemetery treatment plan pending
007-5513/ VA Central Railroad	Augusta	Historic Linear Resource	Avoid or Evaluate	Unevaluated	Determined Eligible
007-5527	Augusta	House	Avoid or Mitigate	Eligible	Pending
007-5528	Augusta	House	Avoid or Mitigate	Unevaluated	Pending
007-5530	Augusta	Historic Farmstead	Avoid or Mitigate	Unevaluated	Determined Eligible
007-5542	Augusta	House	Avoid or Mitigate	Eligible	Pending
007-5554	Augusta	House	Avoid or Evaluate	Unevaluated; inaccessible	Pending
007-5583	Augusta	House	Avoid or Evaluate	Unevaluated, inaccessible	Concur
007-5587	Augusta	House	Avoid or Evaluate	Unevaluated; inaccessible	Pending
007-5689	Augusta	House	Avoid or Mitigate	Eligible	Concur
007-5729	Augusta	Historic Church and Cemetery	Avoid Cemetery	Not Eligible	Cemetery treatment plan pending
007-5730	Augusta	Historic Church and Cemetery	Avoid Cemetery	Not Eligible	Cemetery treatment plan pending
021-5012/ ANST	Augusta and Nelson	Historic Linear Resource	Avoid by HDD	Eligible	Concur
080-5161/ BRP Hist. District	Augusta and Nelson	Historic District	Avoid	Unevaluated	Determined Eligible
008-0011	Bath	Historic Farmstead	Avoid or Mitigate	Eligible	Concur
008-0126	Bath	House	Avoid or Mitigate	Eligible	Concur
008-5053	Bath	House	Avoid or Mitigate	Eligible	Concur
008-5066	Bath	House	Avoid or Mitigate	Eligible	Pending
008-5067	Bath	Historic Cemetery	Avoid	Not Eligible	Cemetery treatment plan pending
012-5174	Brunswick	Historic Cemetery	Avoid	Not Eligible	Cemetery treatment plan pending
012-5190	Brunswick	Historic Cemetery	Avoid	Not Eligible	Cemetery treatment plan pending
014-5059/ Second Liberty Baptist Church and Cemetery	Buckingham	Historic Church and Cemetery	Avoid	Eligible	Determined Eligible; Cemetery treatment plan pending

TABLE 4.10.1-2 (cont'd)

National Register or Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in Virginia

Site Name and Number	County/City	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
014-5060/ First Liberty Baptist Church and Cemetery	Buckingham	Historic Church and Cemetery	Avoid	Eligible	Determined Eligible; cemetery treatment plan pending
014-5062	Buckingham	Historic Farmstead	Avoid or Mitigate	Eligible	Determined Eligible
014-5066	Buckingham	House	Avoid or Evaluate	Unevaluated, inaccessible	Concur
024-0416/ High Bridge Battlefield	Cumberland and Prince Edward	Historic Battlefield	Avoid or Mitigate	Eligible	Determined Eligible
024-5006/ Cumberland Church Battlefield	Cumberland	Historic Battlefield	Avoid or Mitigate	Eligible	Determined Eligible
045-0120/ McDowell Battlefield	Highland and Augusta	Historic Battlefield	Avoid or Mitigate	Eligible	Concur
062-0092	Nelson	House	Avoid or Mitigate	Eligible	Concur
062-0117/ Wintergreen Country Store	Nelson	Historic Commercial Building	Avoid or Mitigate	Listed	Concur
062-5119/ South Rockfish Valley Rural Historic District	Nelson	Historic Rural Historic District	Avoid or Mitigate	Listed	Concur
062-5119-0113	Nelson	House	Avoid or Mitigate	Eligible	Pending after Evaluation
062-5121/ Red Apple Orchards	Nelson	Historic Landscape	Avoid or Evaluate	Potentially Eligible	Concur
062-5160/ Warminster Rural Historic District	Nelson	Historic District	Avoid or Mitigate	Eligible	Concur
062-5180	Nelson	Chesapeake and Ohio Railroad	Avoid Using HDD	Eligible	Concur
014-5091	Buckingham	House	Avoid or Evaluate	Unevaluated; inaccessible	Pending
014-5074	Cumberland	House	Avoid or Evaluate	Unevaluated, inaccessible	Pending
004-5013/ Sayler's Creek Battlefield	Prince Edward	Historic Battlefield	Avoid or Mitigate	Eligible	Determined Eligible

TABLE 4.10.1-2 (cont'd)

National Register or Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in Virginia

Site Name and Number	County/City	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
073-5014/ Rice's Station Battlefield	Prince Edward	Historic Battlefield	Avoid or Mitigate	Eligible	Determined Eligible
026-0007 Harper House	Dinwiddie	House	Avoid or Mitigate	Eligible	Concur
026-5222	Dinwiddie	House	Avoid or Evaluate	Unevaluated, Inaccessible	Pending
026-5257	Dinwiddie	Historic Church and Cemetery	Avoid Cemetery	Not Eligible	Cemetery treatment plan pending
012-5017	Brunswick	Cemetery	Avoid	Not Eligible	Cemetery treatment plan pending
012-5191	Brunswick	Historic House	Avoid or Evaluate	Unevaluated	Pending
087-5618	Southampton	House	Avoid or Evaluate	Unevaluated, Inaccessible	Pending
087-5505/ Powel Dairy Farm	Southampton	Historic Farmstead	Avoid	Eligible	Determined Eligible
087-5609	Southampton	Church and Cemetery	Avoid Cemetery	Not Eligible	Pending; Cemetery treatment plan pending
087-5610	Southampton	House	Avoid or Evaluate	Unevaluated, inaccessible	Concur
131-5325/ Sunray Agricultural Historic District	Chesapeake	Historic District	Avoid or Mitigate	Eligible	Pending
133-0025	Suffolk	House	Avoid or Evaluate	Potentially Eligible	Concur
133-0101	Suffolk	Historic Farmstead	Avoid or Mitigate	Eligible	Concur
133-0105	Suffolk	Corn Crib	Avoid or Evaluate	Unevaluated	Pending
133-5039/ Suffolk II Battlefield	Suffolk	Historic Battlefield	Avoid or Mitigate	Eligible	Concur
133-5443	Suffolk	House	Avoid or Mitigate	Eligible	Pending
133-5474	Suffolk	Historic Cemetery	Avoid	Not Eligible	Cemetery treatment plan pending
133-5481	Suffolk	Historic House and Cemetery	Avoid Cemetery	Not Eligible	Cemetery treatment plan pending
133-5482	Suffolk	House	Avoid or Evaluate	Unevaluated, Inaccessible	Pending
133-5492	Suffolk	House	Avoid or Mitigate	Eligible	Pending
133-5498	Suffolk	House	Avoid or Evaluate	Unevaluated, inaccessible	Pending survey

TABLE 4.10.1-2 (cont'd)

National Register or Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in Virginia

Site Name and Number	County/City	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
133-5499	Suffolk	House	Avoid or Evaluate	Unevaluated, inaccessible	Pending survey
133-5499	Suffolk	Historic Structure	Avoid or Evaluate	Unevaluated	Pending
133-5498	Suffolk	Historic Structure	Avoid or Evaluate	Unevaluated	Pending
131-0035	Suffolk	Dismal Swamp Canal	Avoid or Mitigate	Listed	NA
091-5098/ Norfolk Petersburg Railroad		Historic Railroad	Avoid Using HDD	Eligible	Concur

We received several comments regarding cultural sites such as prehistoric artifacts, historic structures, and burials on landowners' properties that may be affected by ACP in Virginia. In response, Atlantic identified landowner parcels that would no longer be affected by ACP, and identified parcels where surveys were completed, but no historic properties were identified within the APE on commenter's parcels. In addition, subsequent to certain comments, Atlantic adopted route modifications to avoid cultural sites in Virginia. Atlantic also reported that it has not been granted access to survey at certain parcels, and cannot complete those surveys and report on their findings. Atlantic would be required to complete surveys and evaluate the significance of cultural sites within the APE prior to construction (see section 4.10.7).

Yogaville

We received numerous comments regarding the Satchidananda Ashram-Yogaville community and Light of Truth Universal Shrine. Stakeholders expressed concerns that the peaceful setting of the culturally significant retreat would be impacted by the project. In its May 4, 2016 meeting of the review board, the VDHR granted Yogaville approval to proceed with a NRHP nomination as a historic district that represents the historic interfaith movement (VDHR, 2016).

We asked Atlantic to consider effects on the Yogaville cultural site, and the company responded that the pipeline route is located approximately 0.5 mile to the southwest of Yogaville and 1.0 mile from the shrine which is the focus of the property. An inventory of the historic district (DHR ID #014-5067) has not been finalized and the final boundaries have not been determined. The VDHR stated in a comment letter that the analysis of impacts on Yogaville has not been completed, and the VDHR has rendered no opinion on effects to this property.

Linear Resources

We received several comments regarding potential impacts on linear resources. The ACP route crosses four linear historic resources in Virginia, not including waterbodies. The ANST and the BRP are both federal properties that are eligible for listing in the NRHP. Atlantic proposes to avoid effects on these historic properties by using the HDD method for construction (see section 2.3.3.2; also see section 4.10.6 regarding temporary adverse effects to the ANST). Atlantic also proposes to use an HDD to install the pipeline under the NRHP-eligible Chesapeake and Ohio Railroad and the Norfolk Petersburg Railroad.

Civil War Battlefields

In Virginia, Atlantic identified six Civil War battlefields within the project APE. Some of these are in the Shenandoah Valley, and included in the Shenandoah Valley Battlefields National Historic District. The Shenandoah Valley Battlefields Foundation (SVBF) supports programs and promotes the protection and study of the Civil War battlefields within the historic district. Atlantic has consulted with the SVBF and met with them in April 2016. Atlantic provided updates about the project, route modifications, and field survey reports to the SVBF and would continue to consult with them as needed.

As required in the VDHR survey guidelines, Atlantic conducted systematic metal detecting over the battlefields in the APE in Virginia. These surveys did not detect any buried material such as metal objects associated with armed battles that might represent Civil War activity.

Historic Districts

We received numerous comments, including letters and public meeting statements, from the Nelson County Historic Society about possible project impacts on the Warminster Rural Historic District, a historic property located in Nelson County, Virginia that was determined eligible for listing in the NRHP in 2015. Atlantic surveyed the historic district for ACP and recommended that it retains sufficient integrity to remain eligible for listing; the VDHR agreed with this recommendation. Since Atlantic's survey, the Nelson County Historical Society filed a comment letter along with supporting material reporting that the VDHR Evaluation Committee approved an expansion of the NRHP-eligible boundary of the Warminster Rural Historic District. The newly drawn boundary now includes historic African-American properties, such as the Woodson Store, the Black Odd Fellows Hall, five cemeteries, and African-American homes. The pipeline corridor now crosses approximately 2.3 miles of the Warminster Historic District. Atlantic has committed to assess potential effects of ACP on the historic district, consult with the VDHR and other interested parties as needed, and make recommendations for further evaluation or mitigation of adverse effects.

We received comments about effects on the South Rockfish Rural Historic District, also in Nelson County, Virginia. The South Rockfish Rural Historic District includes 131 contributing resources and 117 noncontributing resources. It is significant for the periods 1737 to 1966 under the categories of Agriculture, Architecture, and Commerce, and has been determined eligible for NRHP listing by the VDHR. The current route would intersect the midsection of the South Rockfish Rural Historic District, and may affect individual properties that are eligible or listed in the NRHP. Atlantic surveyed the historic district and recommended that it retained sufficient integrity to remain eligible; the VDHR agreed with this recommendation. We asked Atlantic to consider the Spruce Creek Route Variation to avoid impacts on properties in the South Rockfish Rural Historic District. We received numerous comments opposing this alternative, mostly from landowners where the route variation would be located. As discussed in section 3.4.1, we evaluated the Spruce Creek Route Variation and concluded it would not offer a significant environmental advantage when compared to Atlantic's proposed route. Atlantic has committed to assess potential effects on the historic district, consult with the VDHR and other interested parties as needed, and make recommendations for further evaluation or mitigation of adverse effects.

We received comments about the Norwood-Wingina area and potential effects on historic sites. A 2014 study evaluated the cultural resources and recommended the boundaries for the Norwood-Wingina Rural Historic District, which the study recommended as eligible for listing in the NRHP. Subsequent to receipt of the comments, Atlantic incorporated a route modification that would avoid the Norwood-Wingina Rural Historic District, therefore, as the project corridor is currently designed, no effects on cultural resources in this historic district would occur.

Individuals and the Norfolk County Historical Society of Chesapeake commented about potential effects on the Sunray Agricultural Historic District within the City of Chesapeake, Virginia. This historic district, which was listed in the NRHP in 2007, is significant for its ethnic European heritage and agricultural community development. Atlantic proposes to use two access roads that extend into the Sunray Historic District. These roads are existing dirt-paved rights-of-way and would not be modified for ACP use. Atlantic concludes that there would be no effect on the historic district by use of these roads.

The Koontz family filed comments about their property known as "The Wilderness" in Bath County, Virginia (site number 008-0011). The historic farmstead meets the criteria for listing on the NRHP and includes a residence, numerous outbuildings, and agricultural fields. The VDHR commented that the property was determined eligible for listing on the NRHP in its review of the historic architecture survey report that documented the property. In addition, on June 15, 2017, the VDHR review boards approved the nomination of The Wilderness for listing on the Virginia Landmarks Registry and the NRHP. In response to our request for more information, Atlantic reported that the driveway that passes next to the main residence of The Wilderness has been removed from the project design for use as an access road. However, the pipeline is still located in the wooded and agricultural portions of the property. An assessment of effects and proposed mitigation for the historic property would be completed before project construction.

We received numerous comments regarding possible historic burials or cemeteries within the APE in Virginia. Property owners along Gully Tavern Road in Rice, Virginia expressed concerns about a family cemetery and unmarked graves. Atlantic responded that the survey of the APE in this area did not identify cemeteries or evidence of unmarked graves. The Old Dominion Appalachian Trail Club commented that the Lowe Family Cemetery was near the project corridor. Atlantic responded that this cemetery is 4 miles northeast of the project. Arthur T. Goodloe commented that his family mausoleum was near the project area. Atlantic responded that the project corridor passes 5.5 miles southwest of Mr. Goodloe's property.

As noted above, Atlantic identified 24 burials and historic cemeteries, some currently in use, in the APE in Virginia. Seven of these are associated with churches, and some are private cemeteries or individual burials. Atlantic conducted additional reconnaissance using pedestrian survey and probing using metal rods to identify any additional burials outside the known cemetery boundaries. Atlantic provided a cemetery delineation report for 10 cemeteries in the APE in Virginia. State laws protect burials and cemeteries from disturbance. Atlantic would avoid cemeteries and burials with an appropriate buffer during construction, and would file treatment plans identifying methods (e.g., fencing, vegetation buffers) to avoid impacts on cemeteries during construction. In addition, avoidance measures would be depicted on construction alignment sheets.

Cultural Attachment

We received multiple comments regarding cultural attachment. Letters filed on the docket and commenters at public meetings requested that the FERC assess the cultural attachment that residents of Nelson and Buckingham Counties experience, and consider whether this experience is threatened by ACP.

Historic preservation laws and regulations do not require an assessment of cultural attachment, and do not recognize a property type defined by cultural attachment. The laws do, however, recognize several property types that can convey the experience of cultural attachment, such as historic districts, historic landscapes, and traditional cultural properties. The FERC would review, in consultation with state and federal agencies as well as stakeholders, adverse effects on historic properties, including the historic districts in Nelson and Buckingham Counties. Because the historic districts are primarily comprised of aboveground structures, and the main facility of the project is an underground pipeline, the chief adverse effect to historic districts would be alteration of the setting such as the altered view because of the visible pipeline corridor. The setting of the rural Virginia counties is one of rolling hills, forests, small farm fields

and widely spaced residences. The visible pipeline facilities such as Compressor Station 2 will be visible from the road, but largely obscured by the hilly and forested landscape. We do not anticipate any negative impacts on the rural community's cultural attachment to the landscape. See also the discussion of the Union Hill/Union Grove area in section 4.10.3.

North Carolina

Atlantic submitted separate reports for archaeology and historic architecture in North Carolina. As described in section 2.1, the portion of ACP in North Carolina includes the entire AP-2 mainline, a portion of the AP-3 lateral, Compressor Station 3 (in Northampton County), 3 M&R stations, 4 pig launcher/receiver facilities, 8 cathodic protection groundbeds, 7 communication towers, as well as off-corridor contractor yards and access roads.

Atlantic has completed surveys along portions of the AP-2 mainline and AP-3 lateral, as well as Compressor Station 3, the M&R stations, the pig launcher/receiver facilities, and seven groundbed locations. In addition to remaining surveys along the AP-2 mainline and AP-3 lateral, surveys have not yet been completed at the communication tower locations or one groundbed location. Numerous contractor yards and access roads have been surveyed, but project planning may require additional yards or roads, and added survey. Atlantic reports that it has surveyed 96.4 percent of the APE for direct effects and 100 percent of the APE for indirect effects to historic architecture. Atlantic will survey and report on the remaining 3.6 percent of the APE for direct effects.

In North Carolina, Atlantic recorded 67 cultural resources sites within the APE that are recommended as potentially eligible for listing in the NRHP, or have not been fully evaluated for eligibility, and cemeteries that are protected by state laws. This total includes 22 archaeological sites, 26 cemeteries (1 associated with the Halifax County Hospital, and 2 associated with private houses), 2 battlefields, 16 standing structures, and the Seaboard Railroad. Atlantic did not identify any locations in the APE that required deep testing in North Carolina. Atlantic is conducting additional surveys and evaluative testing to determine if sites that cannot be avoided meet the criteria for listing in the NRHP.

Atlantic's contractor ERM submitted an initial archaeology report and four addenda to the NCDNCR[34] for its review. The agency provided comments on four reports. In addition, Atlantic's contractor Dovetail Cultural Resources Group prepared an initial historic architecture survey report and one addendum. ERM produced a second, third, and fourth addendum survey report. ERM also met with the NCDNCR to clarify eligibility criteria for standing structures, and submitted a letter report documenting revised eligibility recommendations for sites CD1457 and CD1465. In these addenda reports, ERM committed to preparing a supplemental report that will summarize the work completed to date, identify those historic architecture resources that remain in the APE, and assess project effects to the historic properties.

ERM conducted evaluation testing at 27 archaeology sites in North Carolina. They recommended 7 sites as eligible for listing in the NRHP, 2 sites that do not have deposits contributing to eligibility in the APE, and 18 sites as not eligible. NCDNCR commented on one evaluation testing report, and concurred that three sites are not eligible and two sites are eligible for listing in the NRHP. Comments on the remaining 22 sites are pending.

Atlantic identified 26 cemeteries within the APE in North Carolina. Atlantic has committed to avoiding impacts on cemeteries and would avoid cemeteries and burials with an appropriate buffer during construction. Atlantic conducted additional survey at eight cemeteries and submitted a cemetery

[34] The NCDNCR serves as the North Carolina SHPO.

delineation report. The NCDNCR concurred with the findings in this report. Atlantic would file treatment plans identifying methods (e.g., fencing, vegetation buffers) to avoid effects on cemeteries during construction. In addition, avoidance measures would be depicted on construction alignment sheets.

Table 4.10.1-3 summarizes the cultural resources identified to date in North Carolina that are recommended eligible or potentially eligible for listing in the NRHP, are unevaluated for listing, or are cemeteries that would be avoided during construction. The table is based on numerous reports and other filings, and is the best data currently available. It is subject to changes while adjusting the project route and workspace, and additional cultural resources investigations.

Civil War Battlefields

The project APE intersects with two battlefields in North Carolina, the Averasborough Battlefield and the Bentonville Battlefield. The NCDNCR has not commented on historic battlefields in North Carolina to date.

4.10.1.2 Supply Header Project

DETI described the APE for direct project effects as the construction footprint where ground-disturbing activities are possible. DETI surveyed a 300-foot-wide linear corridor for the pipeline, 50-foot-wide corridor for access roads, and the footprint for other facilities and temporary workspaces. DETI described the APE for historic architecture (above ground) resources as the area for direct effects plus the surrounding areas within view of new construction, or changes to the landscape. The APE for the off-corridor facilities and workspaces was the footprint and the adjacent area in which visual, audible, and atmospheric effects could occur. The size of this APE varied according to the surroundings, but was generally within 500 feet of the pipeline corridor. DETI used survey methods mandated by the Pennsylvania and West Virginia SHPOs, including pedestrian survey of the entire route and shovel tests at locations with reduced ground visibility. DETI has surveyed 100 percent of the APE for historic architecture, and has surveyed 100 percent of the APE for archaeological resources in Pennsylvania. In West Virginia, DETI has surveyed 100 percent of all workspaces except for 0.2 percent of the pipeline corridor.

Pennsylvania

DETI completed cultural resources surveys for SHP in Pennsylvania, including a Phase I archaeological survey for the 3.9-mile-long TL-636 loopline, the JB Tonkin Compressor Station (in Westmoreland County), the Crayne Compressor Station (in Green County), the pig receiver facility, the pig launcher facility, along with contractor yards and access roads. DETI reported that it has surveyed 138.2 acres, which is the entire SHP project area in Pennsylvania for both archaeological and historic architecture resources.

DETI identified two historic archaeological sites that were previously recorded and determined not eligible for listing in the NRHP, and have since been destroyed. No new archaeological sites were identified during the initial SHP survey, and no locations in Pennsylvania were identified for possible deeply buried sites requiring deep testing. The Pennsylvania Bureau for Historic Preservation (PABHP)[35] concurred with the findings of the survey report and addenda, and no further work is recommended for those areas reported.

[35] The PABHP serves as the Pennsylvania SHPO.

TABLE 4.10.1-3

National Register of Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in North Carolina

Site Name and Number	County	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
31CD2019	Cumberland	Prehistoric	Avoid untested portion of site outside workspace; avoidance plan pending	Potentially Eligible; portion of site in workspace Not Eligible	Pending after testing
31CD2055	Cumberland	Prehistoric	Avoid or Mitigate	Eligible, after testing	Concur; Pending after testing
31CD2091	Cumberland	Historic Cemetery	Avoid	Unknown	Pending; Cemetery treatment plan pending
31CD2100	Cumberland	Prehistoric	Avoid or Mitigate	Eligible after testing	Pending
31CD2106	Cumberland	Prehistoric	Avoid or Mitigate	Eligible after testing	Pending
31CD2118	Cumberland	Prehistoric	Phase II ongoing	Unevaluated	Pending
31CD2124	Cumberland	Prehistoric	Avoid site outside of APE	Eligible, portion in APE not contributing	Pending
31CD2126	Cumberland	Prehistoric	Phase II pending	Unevaluated	Pending
31CD2127	Cumberland	Prehistoric	Phase II pending	Unevaluated	Pending
31HX358	Halifax	Prehistoric	Phase II pending	Unevaluated	Pending
31HX478	Halifax	Prehistoric	Phase II pending	Unevaluated	Pending
31HX479	Halifax	Prehistoric	Phase II pending	Unevaluated	Pending
31JT423	Johnston	Prehistoric	Avoid or Mitigate	Eligible	Pending after testing
31JT437	Johnston	Historic Cemetery	Avoid	Unknown	Pending; Cemetery treatment plan pending
31JT452	Johnston	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
31JT461	Johnston	Historic Cemetery	Avoid	Unknown	Pending; Cemetery treatment plan pending
31JT465	Johnston	Prehistoric and Historic	Phase II ongoing	Unevaluated	Concur; Pending after
31JT470	Johnston	Prehistoric	Phase II ongoing	Unevaluated	Pending
31JT485	Johnston	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
31JT489	Johnston	Prehistoric	Phase II pending	Unevaluated	Pending
31JT491	Johnston	Prehistoric	Avoid site outside of APE	Unevaluated, portion in APE not contributing	Pending
31NS161	Nash	Unknown	Phase II ongoing	Unevaluated	Pending

TABLE 4.10.1-3 (cont'd)

National Register of Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in North Carolina

Site Name and Number	County	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
31NS162	Nash	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
31NS171	Nash	Historic Cemetery	Avoid	Unknown	Pending; Cemetery treatment plan pending
31NS173	Nash	Historic Cemetery	Avoid	Unknown	Pending; Cemetery treatment plan pending
31NP388	Northampton	Historic Cemetery	Avoid	Not Eligible	Concur: Cemetery treatment plan pending
31NP391	Northampton	Prehistoric	Avoid or Mitigate	Eligible after testing	Concur
31NP392	Northampton	Prehistoric	Avoid or Mitigate	Eligible after testing	Concur
31RB515	Robeson	Prehistoric	Phase II pending	Unevaluated	Pending
31RB540	Robeson	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
31RB572	Robeson	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
31RB574	Robeson	Prehistoric	Phase II ongoing	Unevaluated	Pending
31WL351	Wilson	Prehistoric and Historic	Avoid or Mitigate	Eligible after testing	Pending
HT0131/ Averasborough Battlefield Historic District	Cumberland and Harnett	Historic Battlefield	Avoid or Mitigate	Eligible	Pending
CD1414	Cumberland	Historic Cemetery	Avoid	Not Eligible	Pending
CD1450/ Seaboard RR	Cumberland	Historic Railroad	Avoid or Mitigate	Eligible	Pending
CD1461	Cumberland	Historic Cemetery	Avoid	Not Eligible	Concur
CD1465	Cumberland	Historic House	Avoid or Mitigate	Eligible	Pending
CD1477	Cumberland	Historic Fire Tower	Avoid or Mitigate	Eligible	Pending
HX0021/ Halifax County Home and Hospital	Halifax	Historic Hospital and Cemetery	Avoid	Listed	Avoidance and Cemetery treatment plan pending
HX0227	Halifax	Historic Structures	Avoid or Mitigate	Eligible	Pending
HX0228	Halifax	Historic Structures	Avoid or Mitigate	Eligible	Pending
HX0229	Halifax	Historic Farmstead	Avoid or Mitigate	Eligible	Pending
HX1566	Halifax	Historic School	Avoid or Mitigate	Eligible	Pending

TABLE 4.10.1-3 (cont'd)

National Register of Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in North Carolina

Site Name and Number	County	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
JT1355/ Bentonville Battlefield	Johnston	Historic Battlefield	Avoid or Mitigate	Listed	NA
JT1860	Johnston	Smithfield Fire Lookout Tower	Avoid or Mitigate	Eligible	Pending
JT1869/ Massengill Cemetery	Johnston	Historic Cemetery	Avoid	Not Eligible	Cemetery treatment plan pending
JT1920/ Stevens Sausage Company	Johnston	Historic Structure	Avoid or Mitigate	Eligible	Pending
JT1921/ Stevens Sausage Factory	Johnston	Historic Structure	Avoid or Mitigate	Eligible	Pending
JT1926	Johnston	Historic Structure	Avoid or Evaluate	Unevaluated, Inaccessible	Pending
JT1929	Johnston	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
JT1935	Johnston	Historic Structure	Avoid Cemetery	Not Eligible	Pending
JT1936	Johnston	Historic Structure	Avoid or Evaluate	Unevaluated, Inaccessible	Pending
JT1945	Johnston	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
JT1951	Johnston	Historic Structure	Avoid or Evaluate	Unevaluated, Inaccessible	Pending
JT1955	Johnston	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
NS0650/ May House	Nash	Historic House	Avoid or Mitigate	Eligible	Pending
NS1490	Nash	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
NS1493	Nash	Historic House	Avoid or Mitigate	Eligible	Pending
NS1523	Nash	Historic Cemetery	Avoid	Not Eligible	Pending
NP0488/ Faison Cemetery	Northampton	Historic Cemetery	Avoid	Not Eligible	Concur; Cemetery treatment plan pending
NP0534	Northampton	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending

TABLE 4.10.1-3 (cont'd)

National Register of Historic Places-Eligible and Unevaluated Cultural Resource Sites, and Cemeteries within the Atlantic Coast Pipeline Area of Potential Effects in North Carolina

Site Name and Number	County	Temporal/Cultural Association	Treatment Recommendation	Atlantic NRHP Eligibility Recommendation	SHPO Comment
NP0536	Northampton	House and Cemetery	Avoid Cemetery	Not Eligible	Pending; Cemetery treatment plan pending
SP0693	Sampson	Historic Cemetery	Avoid	Not Eligible	Pending; Cemetery treatment plan pending
SP0697	Sampson	Historic Cemetery	Avoid	Not Eligible	Pending
RB0678	Robeson	Historic Structures	Avoid or Mitigate	Eligible	Pending
RB0688	Robeson	House and Cemetery	Avoid Cemetery	Not Eligible	Pending; Cemetery treatment plan pending

DETI conducted a separate survey for historic architecture in Pennsylvania, and identified 19 properties over 50 years of age within the APE. DETI recommended that the 19 properties did not meet the criteria for listing in the NRHP. In an addendum report, DETI inventoried access roads and contractor yards and identified five additional properties, all of which were recommended as not eligible for listing in the NRHP. The PABHP concurred with DETI's recommendations except for one property (the Borland Farm [HS-22]). The agency requested additional archival research and historic aerial photos for this property and ultimately determined that the project would not have adverse effects to the property.

West Virginia

In West Virginia, DETI combined SHP surveys for archaeology and historic architecture into a single report and one addendum, and reported that it completed surveys for 31.2 miles of the TL-635 loopline, the Mockingbird Hill Compressor Station (in Wetzel County), the M&R station, the pig receiver facility, the pig launcher facility, along with off-corridor contractor yards and access roads. DETI completed the historic architecture survey of all project facilities in West Virginia (100 percent complete), and completed archaeological survey for all but a single parcel for project facilities (99.8 percent complete). DETI reported that the Burch Ridge Compressor Station in Marshall County does not require survey because the proposed improvements are limited to the existing footprint. Activities at the Hastings Compressor Station in Wetzel County would consist of abandoning in place two compressor units; as such, DETI did not do a cultural resources survey at that facility.

DETI revisited the location of two previously recorded historic archaeological sites in West Virginia and confirmed that both sites have been destroyed. DETI conducted Phase I surveys and Phase II evaluations in West Virginia. No locations within West Virginia were identified that require deep testing. DETI conducted Phase II testing at 46DO89 and recommended that the prehistoric component was eligible for NRHP listing. The WVDCH concurred with this finding, and added that the historic component was also eligible. If the site cannot be avoided, both components should be mitigated.

DETI identified 4 previously recorded historic architecture properties and inventoried 29 new properties during the current survey. Of these 33 sites, DETI recommended that the Randolph Farm, and

the B&O Short Line, Fishing Creek Spur Railroad (two segments) are eligible for listing in the NRHP. DETI would avoid the 2 recommended eligible properties during construction.

DETI identified 3 cemeteries within the SHP APE in West Virginia. The Knights of Pythias Cemetery is within 100 feet of a proposed access road, but not within the permanent right-of-way, and therefore would not be affected by the project. The remaining two cemeteries, both associated with churches, will be avoided during project activities. DETI would avoid cemeteries and burials with an appropriate buffer during construction. Prior to construction, DETI would conduct additional reconnaissance using pedestrian survey and metal rod probing outside cemeteries within 150 feet of construction and other project workspace. DETI would file treatment plans identifying methods (e.g., fencing, vegetation buffers) to avoid effects on cemeteries during construction. In addition, avoidance measures would be depicted on construction alignment sheets.

Table 4.10.1-4 summarizes the cultural resources identified to date in the SHP APE in Pennsylvania and West Virginia that are recommended eligible or potentially eligible for listing in the NRHP, and cemeteries that would be avoided during construction. The table contains the best information available at this time, and may change during project planning. All cultural resources sites within the APE will be assessed for eligibility for listing in the NRHP, and reviewed by the relevant SHPO.

4.10.2 SHPO Consultations

Atlantic Coast Pipeline

Atlantic initiated consultations with the West Virginia, Virginia, and North Carolina SHPOs regarding ACP in 2014. Atlantic's initial letters to the WVDCH introduced the project, defined the APE, and described the survey methodology for cultural resources surveys. The WVDCH concurred with the proposed APE and survey methods. To date, the WVDCH has commented on ten survey reports and the *Unanticipated Discovery Plan* (see table 2.3.1-1). The agency did not concur with all of Atlantic's eligibility recommendations, requested additional information, and declined to comment on several resources until more information was provided. The WVDCH commented on the Phase II report on testing at 46PH775 and concurred that the portion of the site in the APE lacks research potential; however, the remainder of the site remains unevaluated. The WVDCH is waiting to review the comprehensive supplemental report on the historic architecture properties for the entire project APE in West Virginia.

In June 2014, Atlantic sent a letter to the VDHR introducing the project and presenting their proposed survey methods. In its response letter, the VDHR concurred with the proposed survey methods and specified that archaeological investigations within the drip line of caves or rock hangings are subject to the Cave Protection Act. Atlantic also consulted with VDHR about the FERC pre-filing process, permit applications, and field artifact analysis.

TABLE 4.10.1-4

National Register of Historic Places-Eligible and Potentially Eligible Cultural Resources, and Cemeteries within the Supply Header Project Area of Potential Effects

Site Number/ Name	State/County	Temporal/Cultural Association	Treatment Recommendation	DETI NRHP Recommendation	SHPO Comment
HS-22/ Borland Farm	PA/Westmoreland	Historic Farmstead	Per SHPO, no adverse effect from project	Not Eligible	Did not concur; Eligible
46DO89	WV/Doddridge	Prehistoric habitation/Historic Farmstead	Avoid or Mitigate	Prehistoric Component Eligible, Historic Component Not Eligible	Did not concur with Not Eligible recommendation for Historic Component
FN-6/ Randolph Farm	WV/Doddridge	Historic Log Cabin, Farmstead	No Effect/ Shielded by tree cover	Eligible	Concur
WZ-0025-0010, WZ-0036 B&O Short Line, Fishing Creek Spur	WV/Wetzel	Historic Railroad	Avoid by boring	Eligible	Concur
46DO90, Victory Baptist Church Cemetery	WV/Doddridge	Historic Cemetery	Avoid	Not Eligible	Concur; Cemetery treatment plan pending
HS-0884, Mount Lebanon Baptist Church and Cemetery	WV/Harrison	Historic Cemetery	Avoid	Not Eligible	Concur; Cemetery treatment plan pending
FN-29, Knights of Pythias Cemetery	WV/Wetzel	Historic Cemetery	Avoid; 100 feet from access road	Not Eligible	Concur; Cemetery treatment plan pending

To date, the VDHR has commented on four archaeological reports and the Virginia *Unanticipated Discovery Plan* (see table 2.3.1-1). The agency concurred with most of Atlantic's findings and recommendations, except for three sites that require further evaluation. The VDHR asked that unevaluated sites be treated as eligible until they can be fully evaluated, and stated that it would review cemetery avoidance plans. The VDHR reviewed reports for six historic architecture reports and concurred with most of the reports' findings. The VDHR did not concur with eligibility recommendations for four properties, and asked for additional information before commenting on several other properties (table 4.10.1-2). The VDHR comments on historic architecture report addenda 5 and 6 are pending, as are VDHR comments on Phase II testing reports.

Atlantic sent a letter to the NCDNCR in June 2014 introducing the project and describing the proposed field survey methods. Atlantic and its cultural resources contractor met with the NCDNCR to discuss the APE and archaeological survey methods. The NCDNCR provided comments on three archaeological reports, concurring with the most of the reports' findings and eligibility recommendations, but requesting additional information regarding survey methods and site recordation, and finding that seven sites recommended eligible do not meet the criteria for eligibility. In an email, the NCDNCR confirmed that deep testing was not required for those areas investigated to date. The NCDNCR reviewed two of the historic architecture reports submitted by Atlantic and requested revisions. The agency also provided comments on the historic architecture report addendum 2; it concurred with DETI's findings except for CD1457, a 1920 dwelling that did not meet the eligibility criteria. Following a meeting with the NCDNCR, DETI submitted revised eligibility recommendations for sites CD1457 and CD1465.

The NCDNCR commented on an Atlantic report on Phase II investigations at five sites in North Carolina. The agency concurred that two sites are eligible for listing on the NRHP and three sites are not eligible. NCDNCR's comments on other Phase II reports are pending. The NCDNCR also commented on a historic cemetery delineation report, concurring with the recommended avoidance measures.

Atlantic will continue to solicit comments from the three SHPOs on survey reports, testing reports, and treatment plans.

Supply Header Project

In October 2014, DETI sent the PABHP a letter introducing SHP and proposing an APE and survey methods. The PABHP replied that there was a high potential for the presence of significant archaeological sites within the project area. DETI submitted Phase I archaeological and historic architecture reports to the PABHP. The PABHP requested a revised Phase I archaeological report that showed the locations of shovel tests, which DETI provided. The PABHP concurred with the content and recommendations of the revised archaeology report, and addendum 1. The agency concurred with the historic architecture findings in the original report and addendum 1, except for the Borland Farm, which PABHP determined was eligible. The agency further determined that the project would have no adverse effects on the historic farmstead.

DETI sent a letter to the WVDCH in October 2014 introducing the project and presenting its proposed survey methods. WVDCH concurred with the proposed survey methods and requested an investigation of the alluvial soils in the project area to identify the potential for deeply buried archaeological sites.

In September 2015, DETI submitted a Phase I cultural resources survey report completed in West Virginia to the WVDCH. The agency concurred with the eligibility recommendations for the archaeology sites identified, but asked DETI to submit a revised report with additional analysis, which it did. The WVDCH concurred with the recommendations in the revised report. The WVDCH declined to provide comments on the architectural resources in the report, and requested more information about the ground clearance and viewshed, and impacts that might affect the historic architecture sites. DETI submitted a revised report, and the WVDCH concurred with the findings and recommendations in this report.

DETI conducted Phase II testing at site 46DO89 and submitted a report to the WVDCH that recommended the prehistoric component of the site as eligible for NRHP listing, but the historic component as not eligible. The WVDCH concurred with the eligibility recommendation for the prehistoric component, but did not concur with the not eligible recommendation for the historic component. The agency commented that if a data recovery is completed for the project, both historic and prehistoric components should be mitigated.

4.10.3 Communications with Other Agencies and the Public

The FS is reviewing the effects of ACP on the MNF and GWNF (which includes the ANST). The NPS manages the BRP. The status of surveys on federal lands is discussed in section 4.10.6.

The VDHR submitted comments requesting inclusion of additional consulting parties, and recommending methods for assessing the historic districts and Civil War battlefields that will be crossed by the project. For drilling operations at historic properties such as the BRP and the ANST, the agency requested contingency plans that address the potential for adverse effects to the historic properties in the event of drill failure.

In April 2016, the ACHP submitted a letter to us following inquiries it received regarding the project and compliance with section 106 of the NHPA. The ACHP was concerned about public outreach, and consideration of granting consulting party status to stakeholders. We responded with a letter describing the public outreach for the project, including Applicant-sponsored open houses, public scoping meetings, and receipt of more than 8,000 written comments. We considered requests for consulting party status according to the relevant regulations. For those groups and individuals that did not meet the consulting party criteria, we asked Atlantic to work with the SHPOs and assist interested stakeholders with obtaining privileged archaeological information on a case-by-case basis. The ACHP also wrote to us in April of 2017, again recommending consulting party status for certain stakeholders. The agency also concurred with the VDHR's letter regarding project impacts to three historic districts and five Civil War battlefields. The ACHP indicated it would participate in the execution of any agreement document prepared for the project.

The NPS commented on resources under its management, or of special concern to them, including the Captain John Smith National Historic Trail, which follows the Nansemond River in Suffolk, Virginia. Atlantic would cross the Nansemond River using the HDD method, which would avoid effects on the river and historic trail. The NPS is also consulting with Atlantic regarding the crossing of the NRHP-eligible BRP (see section 4.10.6). In a subsequent letter, the NPS stated that it had not been consulted under section 106, and requested consulting party status. We hereby accept the NPS' request to be a consulting party for ACP. The agency also requested additional mitigation measures to minimize visual effects to the BRP, and discussed amendments to the FS LRMP that might affect the ANST.

The Nelson County Historical Society, Augusta County Historical Society, Preservation Virginia, and the Rockfish Valley Foundation provided numerous comments regarding impacts on historic properties in Virginia. We asked Atlantic to provide additional information about properties in Nelson, Augusta, and Buckingham Counties in Virginia. The local organizations have requested copies of cultural resources investigation reports completed for the project in Virginia. These reports are not available to the public because they contain information about the location and significance of archaeological sites, protected by section 304 of the NHPA. Atlantic is assisting these stakeholders by consulting with the VDHR, which would coordinate the sharing of survey reports following the signing of confidentiality agreements with the organizations. The Nelson County Board of Supervisors was granted consulting party status in March of 2017.

Other organizations such as Friends of Nelson and the National Trust for Historic Preservation filed letters expressing concerns that interested parties were not granted consulting party status, and that conservation easements would be impacted, and that the project would be approved before historic properties were identified. Consulting party status is discussed in preceding paragraphs. Discussion of conservation easements is provided in section 4.8.

We received additional letters and comments at public meetings about the Union Hill and Union Grove locations near Compressor Station 2 located in Buckingham County, Virginia. Commenters expressed concerns that these locales represent the history of African-American settlement after the Civil War. We asked Atlantic to re-examine the properties located near Compressor Station 2. Atlantic resurveyed the location and expanded the visual APE to include additional properties. Atlantic recorded five properties, all houses with modest outbuildings on large lots and surrounded by hills, forests, and open spaces. Atlantic found that the buildings in the APE were non-farm structures built after World War II, and the overall landscape does not reflect the development of an agricultural community in the late nineteenth and early twentieth centuries. The visual APE does not exhibit a cohesive cultural landscape that would be threatened by construction of Compressor Station 2 and sub-surface pipeline.

As discussed above, Civil War battlefields are an important historic resource in the region of the proposed project. Atlantic and DETI consulted with staff from the Sailor's Creek Battlefield Historical

State Park, located 0.8 mile from the ACP APE, as well as other battlefield groups. All parties agreed that the AP-1 mainline would avoid core areas of the recorded battlefields. Assessment of potential impacts on Civil War battlefields is on-going.

4.10.4 Tribal Consultation

As the lead federal agency, we consulted with federally recognized American Indian tribes that may attach religious or cultural significance to historic properties that could be impacted by ACP and SHP. As described in section 1.3, our February 2015 NOI and two supplemental NOIs (August 2015 and May 2016) were sent to interested parties, including the following federally recognized American Indian tribes: Absentee-Shawnee Tribe of Oklahoma, Catawba Indian Nation, Cherokee Nation, Delaware Tribe of Indians, Delaware Nation, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Seneca Nations of Indians, Seneca-Cayuga Tribe of Oklahoma, Shawnee Tribe, Stockbridge Munsee Community, Tonawanda Band of Seneca Indians, Tuscarora Nation, and the United Keetoowah Band of Cherokee Indians. In addition to the NOIs, we sent two project update newsletters to the same tribes in June 2015 and August 2016.

In addition to our NOIs and project update newsletters, we sent letters requesting comments on the projects to the same 14 tribes in March 2015. In October 2015, we emailed the tribes to inform them that Atlantic and DETI filed their applications, including survey reports. In follow-up emails and phone calls beginning in June 2016, we learned that the Seneca Nation of Indians, the Catawba Indian Nation, the Delaware Tribe of Indians, the Eastern Shawnee Tribe of Oklahoma, the Tonawanda Band of Seneca Indians, and the Tuscarora Nation were interested in more information about the projects. We asked Atlantic to contact these tribes and send them project maps and survey reports as requested by them. Atlantic sent a letter seeking tribal input to the Catawba Indian Nation, the Delaware Tribe of Indians, the Tonawanda Band of Seneca Indians, and the Tuscarora Nation in August 2016. The Catawba Indian Nation responded with a letter stating that they have no immediate concerns regarding the projects, but would like to be notified if Native American artifacts or human remains are encountered during the ground disturbing phase of construction. The Delaware Nation informed us that the project does not endanger cultural or religious sites known to them, and asked that their office be included as a contact in the event of an unanticipated discovery during construction. The Eastern Band of the Cherokee Indians filed a letter on the docket requesting maps and copies of the archaeological survey reports of the project areas. Atlantic and DETI sent copies of all archaeological survey reports to the tribe. We will continue to consult with tribes who are interested in the projects and ensure they get the information they request.

During project planning, the Pamunkey Tribe of Virginia were confirmed as a federally recognized tribe. The tribe contacted us and requested the archaeology survey reports for Virginia. We asked Atlantic to provide the tribe with project reports and plans. On May 12, 2017 Atlantic provided the Pamunkey the requested information. We sent the tribe a copy of the DEIS, and will continue to consult with them.

Representatives of the Lumbee Tribe of North Carolina wrote letters and attended public meetings to express their concerns about possible project effects to their traditional territory in North Carolina. The tribe cited the 1956 Lumbee Recognition Act passed by the U. S. Congress. The tribe expressed concern that their traditional gathering places and locations for collecting medicinal plants may be destroyed. Two other North Carolina tribes, the Haliwa-Saponi, the Coharie, and the Meherrin also wrote to us about their traditional ties to areas along the project route in North Carolina, and requested that they be contacted if archaeological sites, including human remains, are encountered during project construction. We asked Atlantic to communicate with these tribes about possible impacts to sites important to them. Atlantic would also include tribal contact information in the unanticipated discovery plans for those tribes that request notification following a post-review discovery during construction.

Atlantic and DETI are assisting us with communicating project information to federally recognized American Indian tribes. In July 2014, they sent a letter introducing the projects and requesting comments to the same federally recognized tribes listed above. Atlantic's consultant followed up with an additional letter requesting comments in October 2014, and follow-up phone calls and emails. The Eastern Band of Cherokee Indians, the Delaware Nation, and the Stockbridge Munsee Community responded to Atlantic stating that they had no concerns about the project.

In May of 2017, Atlantic met with the representatives of seven tribes; Chickahominey Indian Tribe, Nottoway Tribe of Virginia, Pamunkey Indian Tribe, Upper Mattaponi Indian Tribe, Cheroenhaka (Nottoway) Indian Tribe, Mattaponi Indian Tribe, and Monacan Indian Nation. The tribes expressed concerns about unmarked burial sites and environmental impacts.

Additional discussion of tribal consultations for the portion of the project on federal lands is provided in section 4.10.6. A summary of Atlantic's and DETI's project correspondence with American Indian tribes is provided in appendix V.

4.10.5 Unanticipated Discovery Plans

Atlantic and DETI submitted *Unanticipated Discovery Plans* outlining the actions they would take if archaeological resources including human remains were inadvertently exposed during project construction (see table 2.3.1-1). Atlantic submitted separate *Unanticipated Discovery Plans* for construction within federal lands (see section 4.10.6 and table 2.3.1-1).

Several American Indian tribes commented that they should be contacted in the event of unanticipated discoveries during ground-disturbing project activities. We have recommended in section 4.10.7 that Atlantic and DETI provide revised *Unanticipated Discovery Plans* that include tribal contact information for those tribes that request notification following post-review discovery of archaeological sites, including human remains, during project activities.

Atlantic Coast Project

West Virginia

The WVDCH reviewed the *Unanticipated Discovery Plan* for West Virginia and provided Atlantic with the specific West Virginia state codes that applied, and clarified that Atlantic would be responsible to inform the appropriate county circuit court if human remains are discovered. Atlantic revised the plan accordingly and refiled it. We agree with the added clarifications and find the plan acceptable, pending communication with interested tribes.

Virginia

The VDHR reviewed the *Unanticipated Discovery Plan* to be used during construction in Virginia. The agency requested the addition of language about restricting the viewing of inadvertently discovered Native American burials or funerary objects, but otherwise approved the plan. Atlantic revised the plan and refiled it. We agree that the revised plan is acceptable, pending communication with interested tribes.

North Carolina

Atlantic submitted an *Unanticipated Discovery Plan* for North Carolina to the NCDNCR for its review. The agency responded in a comment letter that the procedures and contacts were in order, and we agree, pending communication with interested tribes. The Haliwa-Saponi Tribe, the Coharie Tribe, and the

Lumbee Tribe have historic ties to the project route in North Carolina, and asked to be notified in the event of the unanticipated discovery of an archaeology site or human remains in their traditional territory in North Carolina.

Supply Header Project

With their application filed in September 2015, DETI provided *Unanticipated Discovery Plans* for Pennsylvania and West Virginia. These plans outline the procedures to follow if unrecorded archaeological sites, including human remains, are inadvertently encountered during construction. These plans were also provided to the PABHP and the WVDCH.

Pennsylvania

DETI provided its *Unanticipated Discovery Plan* for SHP in Pennsylvania. To date, comments have not yet been received from the PABHP regarding the plan for Pennsylvania. DETI would file comments on the Plan from the PABHP, and would communicate with interested tribes.

West Virginia

The WVDCH reviewed the *Unanticipated Discovery Plan* and provided DETI with the specific West Virginia state codes that applied, and clarified that DETI will be responsible to inform the appropriate count circuit court if human remains are discovered. Atlantic revised the plan accordingly and refiled it. We agree that with the added clarifications. The plan is acceptable, pending communication with interested tribes.

4.10.6 Cultural Resources on Federal Lands

ACP would cross the MNF and the GWNF, both managed by the FS; the NRHP-eligible ANST would be crossed by ACP within the GWNF. ACP would also cross the BRP, located in the project APE in Augusta and Nelson Counties, Virginia, a property managed by the NPS.

Atlantic obtained permits in accordance with ARPA before surveying federal land. Atlantic consulted with the FS staff of the MNF and GWNF regarding survey methods, artifact curation, and plans for unanticipated discoveries on their respective national forests. The surveys conducted on federal land used the same APE and survey corridor for surveys completed on non-federal lands (300 feet centered on the pipeline centerline, and 50 feet centered on the mid-line of access roads). The federal land managers asked for a standalone report for each federal property, which Atlantic provided. The results of surveys on the MNF, GWNF, and BRP are summarized below.

The federal agencies met with Atlantic in August 2016 to discuss the proposed HDD crossings of the ANST and BRP. Both historic trails have been surveyed for cultural resources. Atlantic recommends that installation of the AP-1 mainline beneath these features using the HDD method, which would avoid direct long-term adverse effects to the NRHP-eligible trails.

Atlantic is assisting the MNF by sending copies of reports for surveys conducted within the national forest to the MNF tribal partners, as stipulated in the MNF ARPA permit. The MNF tribal partners are the Absentee-Shawnee Tribe of Indians of Oklahoma, Cayuga Indian Nation, Cherokee Nation of Oklahoma, Delaware Nation, Delaware Tribe of Indians, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Oneida Indian Nation of New York, Onondaga Nation of New York, Seneca Nation of Indians, Seneca-Cayuga Tribe of Oklahoma, Shawnee Tribe, Tonawanda Band of Seneca, Tuscarora Nation of New York, and the United Keetoowah Band of Cherokee Indians in Oklahoma. Atlantic sent the original and

revised MNF survey reports to the MNF tribal partners; to date, no comments on the reports have been received.

Atlantic prepared separate *Unanticipated Discovery Plans* for the MNF and GWNF (see table 2.3.1-1). The FS reviewed plans and requested changes, notably that their offices be notified immediately in the event of the discovery of an archaeological site, including human remains during construction. Atlantic submitted revised *Unanticipated Discovery Plans* to the MNF and GWNF. The FS provided comments and its necessary modifications on November 27, 2015, December 11, 2015, and again on January 22, 2016. At the request of the FS, Atlantic also submitted the *Unanticipated Discovery Plan* to the MNF tribal partners; to date, no comments have been received.

Monongahela National Forest

ACP crosses the MNF in Pocahontas County, West Virginia. Atlantic surveyed 273 acres within the MNF, which included the entire direct APE. Atlantic located one previously recorded archaeological site within the APE, and recorded five new sites, all of which were isolated lithic flakes. No aboveground resources were recorded during surveys. Atlantic recommended that all sites recorded within the MNF APE are not eligible for listing in the NRHP. The FS submitted the Phase I survey report to the WVDCH, stating that the FS concurred with the report's findings and recommendations, and requesting the state agency's comments. The WVDCH concurred with the recommendations.

Additionally, from April 17 to April 20, 2017, GAI conducted fieldwork along Buzzard Ridge road and east of Route 92, near Michael Mountain. Daily updates suggest that no historic properties were present along these roads, but the MNF is still waiting to receive a formal technical report from GAI. The forthcoming report will also contain more specific locational information for this fieldwork.

On May 25 and 26, 2017, the MNF received shapefiles that depicted (1) a slightly different placement of the Buzzard Ridge access road, where it extends westward from the centerline between mileposts 71.6 and 71.7; and (2) a set of 25 access road modifications and 4 culverts. It is unclear at this time whether these new additions will require new archaeological surveys. The aforementioned technical report that is still pending should provide clarity.

George Washington National Forest

ACP crosses the GWNF in Highland, Bath, and Augusta Counties, Virginia. After consulting with the GWNF staff, Atlantic completed surveys of the route in the APE, totaling 551.7 acres. As reported, they completed shovel testing along 29 percent of the APE. Atlantic recorded four new prehistoric archaeological sites, two new historic archaeological sites, and six new prehistoric isolated finds. In addition, two previously recorded prehistoric sites were relocated during surveys. No standing structures were recorded. Atlantic recommended that three sites are potentially eligible for listing in the NRHP. No standing structures were reported in the APE; however, the route intersects the ANST within the GWNF in Augusta County. The FS provided comments on the Phase I survey on August 10, 2016 with approval of the survey work and approval to conduct additional Phase II testing on the three sites recommended for evaluation. The FS also requested further investigations for sites 44AU0780, 44AU0914, and 444AU0915. The VDHR concurred with the report's findings and the FS recommendations for additional testing.

Atlantic completed the Phase I survey of the remaining 104.4 acres in the APE and reported the identification of seven newly recorded archaeological sites: two prehistoric lithic scatters, four prehistoric isolated finds, and a series of historic stone box culverts, recorded as a single site. Atlantic recommended these seven sites as not eligible for listing on the NRHP. The survey identified one historic architecture site, the Duncan Knob Lookout Tower, which Atlantic recommends as eligible for NRHP listing. Table

4.10.6-1 summarizes the cultural resources sites (excluding isolated finds) within the GWNF APE and the results of Atlantic's survey and testing.

TABLE 4.10.6-1

Cultural Resource Sites within the Atlantic Coast Pipeline Area of Potential Effects in the George Washington National Forest

Site Number	County	Temporal/Cultural Association	Phase II Treatment Recommendation	Atlantic Phase II NRHP Eligibility Recommendation	FS Comment on Phase II report
44AU0781	Augusta	Prehistoric Lithic Scatter	Protective fencing to avoid site outside of APE[a]	Potentially Eligible	Pending
44AU0917	Augusta	Prehistoric Lithic Scatter, possible Quarry/ Historic hearth and artifact scatter	Protective fencing to avoid site outside of APE[a]	Potentially Eligible	Pending
44AU0918	Augusta	Prehistoric Lithic Scatter	Protective fencing to avoid site outside of APE[a]	Potentially Eligible	Pending
44AU0780	Augusta	Prehistoric Lithic Scatter	None	Unevaluated	Pending
44AU0914	Augusta	Prehistoric Lithic Scatter	None	Not Eligible	Pending
44AU0915	Augusta	Prehistoric Lithic Scatter	None	Not Eligible	Pending
44BA0941	Bath	Prehistoric Lithic Scatter	None	Not Eligible	Pending
44BA0492	Bath	Prehistoric Lithic Scatter	None	Not Eligible	Pending
44BA0493	Bath	Historic Stone Culverts	None	Not Eligible	Pending
Not part of Phase II Testing					
021-5012	Augusta	Historic Trail	Avoid using HDD	Eligible	Pending
008-5071	Bath	Historic Duncan Knob Lookout Tower	No effects	Eligible	Pending

[a] Active Monitoring of the site areas by FS archaeologists for avoidance during construction will be required.

Atlantic filed an ARPA permit application with the GWNF in August 2016, requesting approval to conduct evaluative field testing on the three sites recommended eligible in their survey report. According to the permit application, the GWNF asked Atlantic to conduct testing on three prehistoric sites consisting that Atlantic recommended not eligible (site numbers 44AU0780, 44AU0914, and 44AU0915). Following GWNF approval of its ARPA permit, including the Phase II testing plans, Atlantic conducted fieldwork at the six archaeological sites. Phase II testing methods included systematic shovel probing and excavation of 1-meter by 1-meter test units. Following Phase II testing, Atlantic recommends that sites 44AU0914 and 44AU0915 are not eligible. Site 44AU0780, and sites 44AU0781, 44AU0917, and 44AU0918, are unevaluated until Phase II investigations are completed. The VDHR concurred with the FS findings and eligibility determinations.

As of this time Phase II investigations are ongoing and awaiting results. Currently, the ACP has the potential to adversely affect historic properties on the GWNF. Atlantic has completed a Phase I inventory of the proposed route and is finalizing work on the Phase II evaluations of the cultural resources identified during the Phase I to determine which may qualify as historic properties. For those historic properties that cannot be avoided by ACP, an adverse effect assessment will be made in accordance with 36 CFR 800.5, and a section 106 MOA will be negotiated to mitigate adverse effects per 36 CFR 800.6.

Regarding the ANST, this property was previously determined eligible for the NRHP (Reeve et al., May 2016). Atlantic proposes to mitigate adverse effects on the trail by boring under it. However, according to guidelines established under 36 CFR 800.5: Assessment of Adverse Effects, paragraph 2, subpart 5, the FS finds that ACP would have a temporary adverse effect on the ANST during the boring operations due to the introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.

Blue Ridge Parkway

ACP would cross the NRHP-eligible BRP for 0.1 mile at the border between Augusta and Nelson Counties, Virginia. Following consultation with the NPS and issuance of an ARPA permit, Atlantic surveyed a total of 9.7 acres of the BRP crossing, including the 300-foot-wide corridor and a 400-foot-wide ATWS. No cultural sites were identified. As discussed above, Atlantic would install the pipeline beneath the BRP using the HDD method; therefore, Atlantic recommends that there would be no direct effects on the BRP. Atlantic sent the report documenting surveys at the BRP crossing to the NPS along with the *Unanticipated Discovery Plan* for review. The NPS commented that they were satisfied with the report's findings. They did not comment on the *Unanticipated Discovery Plan*.

4.10.7 Compliance with the National Historic Preservation Act

Compliance with section 106 of the NHPA has not been completed for ACP and SHP. Atlantic and DETI still need to complete cultural resources surveys of proposed project areas and treatment plans for NRHP-eligible sites that cannot be avoided. For all burials and cemeteries in the project APE, Atlantic and DETI would submit treatment plans that detail the measures that will be used during project activities to avoid impacts on these resources. Treatment plans would be reviewed and approved by the appropriate parties including the FERC, the SHPOs, interested tribes, and the federal land managers for federal lands. The FERC would afford the ACHP an opportunity to comment in accordance with 36 CFR Part 800.6. Implementation of a treatment plan would only occur after certification of the projects (if they are reviewed and found acceptable by the Commission) and the FERC provides written notification to proceed. To ensure that the FERC's responsibilities under the NHPA and its implementing regulations are met, **we recommend that:**

- **Atlantic and DETI should <u>not begin</u> construction of ACP and SHP facilities or use of contractor yards, ATWS, or new or to-be-improved access roads <u>until</u>:**

    a. Atlantic files with the Secretary documentation of communications with the Lumbee Indian Nation, Coharie Tribal Council, Haliwa-Saponi Tribe, and the Meherrin Tribe regarding traditional tribal sites, including natural resources gathering locations in the project area.

    b. Atlantic and DETI file with the Secretary:

        i. all survey reports, evaluation reports, reports assessing project effects, and site treatment plans, and cemetery avoidance treatment plans;

        ii. comments on all reports and plans from the Pennsylvania, West Virginia, Virginia, and North Carolina SHPOs, the MNF, GWNF, and NPS, as well as any comments from federally recognized Indian tribes, and other consulting parties, as applicable; and

iii. revised *Unanticipated Discovery Plans* that include tribal contact information for those tribes that request notification following post-review discovery of archaeological sites, including human remains, during project activities;

c. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected; and

d. the FERC staff reviews and the Director of OEP approves the cultural resources reports and plans, and notifies Atlantic and DETI in writing that treatment plans/mitigation measures (including archaeological data recovery) may be implemented and/or construction may proceed.

All material filed with the Commission that contains location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering "CUI//PRIV – DO NOT RELEASE."

4.11 AIR QUALITY AND NOISE

4.11.1 Air Quality

This section of the EIS describes existing air quality; identifies the construction and operating air emissions and projected air quality impacts; and outlines methods that would be used to achieve compliance with regulatory requirements for ACP and SHP.

Temporary air emissions would be generated during project construction, which would occur over a period of about 2 years and across four states; however, most air emissions associated with ACP and SHP would result from the long-term operation of the new and modified compressor stations. Construction and operation air emissions and mitigation measures are discussed in section 4.11.1.3.

4.11.1.1 Existing Air Quality

Regional Climate

ACP and SHP would be constructed in the continental Northeast (West Virginia, Pennsylvania) and Southeast (North Carolina, Virginia) portions of the United States. The Northeast region has four distinct seasons, each of which can produce potentially dangerous storms. Large temperature and precipitation extremes are common in the region, although precipitation is generally distributed evenly throughout the year. The Northeast averages about 40 inches of precipitation annually, with between 17 and 37 inches of snowfall. Average daily temperatures are generally lowest in January and highest in July. Summers are warm and humid, with temperatures in excess 90 °F, and tend to be the rainiest season. During winter months, the average temperatures range from 8 °F to 35 °F, with occurrences of temperatures below 0 °F. Snowstorms and blizzards occur during winter months and droughts, tornadoes, and thunderstorms are characteristic of the region during the other seasons (NOAA, 2013a). In the Southeast, summers are characteristically warm and moist/humid with frequent thundershowers. Virginia and the Carolinas receive an average of 40 to 50 inches of precipitation annually, although precipitation in Southwestern North Carolina exceeds 100 inches annually. The northern portion of the Southeast averages 5 to 25 inches of snowfall annually; however, at higher elevations (Appalachians), snowfall can exceed 100 inches annually. Average minimum temperatures in North Carolina and Virginia range from about 18 °F to 36 °F. In July, average maximum temperatures range from 76 °F to 90 °F. Since 1980, the Southeast has experienced

more billion-dollar weather disasters than any other region, primarily due to hurricanes, tornadoes, and floods (NOAA, 2013b).

Ambient Air Quality Standards

Ambient air quality is protected by federal and state regulations. The EPA has established the National Ambient Air Quality Standards (NAAQS) to protect human health and welfare. The NAAQS include primary standards that are designed to protect human health, including the health of "sensitive" individuals such as children, the elderly, and those with chronic respiratory problems. The NAAQS also include secondary standards designed to protect public welfare, including visibility, vegetation, animal species, economic interests, and other concerns not related to human health. We received comments regarding the impact of compressor station emissions on public health. These are discussed below.

Standards have been set for seven principal pollutants that are called "criteria pollutants." These criteria pollutants are ground-level ozone, carbon monoxide (CO), oxides of nitrogen (NO_X), sulfur dioxide (SO_2), fine particulate matter (inhalable particulate matter with an aerodynamic diameter less than or equal to 10 microns [PM_{10}] and $PM_{2.5}$), and airborne lead. Ozone is not emitted into the atmosphere from an emissions source; it develops as a result of a chemical reaction between NO_X and VOC in the presence of sunlight. Therefore, NO_X and VOCs are often referred to as ozone precursors and are regulated to control the potential for ozone formation. The current NAAQS are listed on the EPA's website at www.epa.gov/criteria-air-pollutants/naaqs-table (EPA, 2016b).

Air quality control regions (AQCR) are areas established by the EPA and local agencies for air quality planning purposes, in which State Implementation Plans describe how the NAAQS would be achieved and maintained. The AQCRs are intra- and interstate regions such as large metropolitan areas where improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. Each AQCR, or smaller portion within an AQCR (such as a county or multiple counties), is designated, based on compliance with the NAAQS, as attainment, unclassifiable, maintenance, or nonattainment, on a pollutant-by-pollutant basis. Areas in compliance, or below the NAAQS, are designated as attainment, while areas not in compliance, or above the NAAQS, are designated as nonattainment. Areas previously designated as nonattainment that have since demonstrated compliance with the NAAQS are designated as maintenance for that pollutant. Maintenance areas may be subject to more stringent regulatory requirements similar to nonattainment areas to ensure continued attainment of the NAAQS. Areas that lack sufficient data are considered unclassifiable and are treated as attainment areas. ACP and SHP counties designated as nonattainment and maintenance with the NAAQS are shown in table 4.11.1-1 (EPA, 2015). All other counties crossed by the projects are in attainment with the NAAQS.

TABLE 4.11.1-1

Status of Affected Counties Designated Nonattainment and Maintenance

State	County	Nonattainment	Maintenance
West Virginia	Marshall	2010 24-hour SO_2	1997 $PM_{2.5}$ 1997 8-hour Ozone[a]
Virginia	Suffolk	-	1997 8-hour Ozone
	Chesapeake	-	1997 8-hour Ozone
North Carolina	Nash	1997 8-hour Ozone	-
	Johnston	1997 8-hour Ozone	-
Pennsylvania	Westmoreland	1997 8-hour Ozone 2008 8-hour Ozone	1997 $PM_{2.5}$ 2006 24-hour $PM_{2.5}$
	Greene	2006 24-hour $PM_{2.5}$ 1997 8-hour Ozone	

[a] The 1997 8-hour ozone NAAQS were revoked April 6, 2015.

The EPA now defines air pollution to include the mix of six long-lived and directly emitted greenhouse gases (GHG), finding that the presence of the following GHGs in the atmosphere may endanger public health and welfare through climate change: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. As with any fossil-fuel fired project or activity, ACP and SHP would contribute GHG emissions. The principle GHGs that would be produced by the projects are CO_2, CH_4, and N_2O. No fluorinated gases would be emitted by the projects. GHG emissions are quantified and regulated in units of CO_2 equivalents (CO_2e). The CO_2e takes into account the global warming potential (GWP) of each GHG. The GWP is a ratio relative to CO_2 of a particular GHG's ability to absorb solar radiation as well its residence time within the atmosphere. Thus, CO_2 has a GWP of 1, CH_4 has a GWP of 25, and N_2O has a GWP of 298 (U.S. Global Change Research Program, 2014).[36] We received comments on the amount and impacts of GHG emission the projects would contribute. In compliance with the EPA's definition of air pollution to include GHGs, we have provided estimates of GHG emissions for construction and operation, as discussed throughout this section. Impacts from GHG emissions (i.e., climate change) are discussed in more detail in section 4.13.3.12.

Air Quality Monitoring and Existing Air Quality

Most operational emissions from ACP and SHP would result from operation of the compressor stations. The EPA as well as state and local agencies have established a network of ambient air quality monitoring stations to measure and track the background concentrations of criteria pollutants across the United States. Data were obtained from representative air quality monitoring stations to characterize the background air quality for each compressor station and are presented in tables 4.11.1-10 and 4.11.1-12 in combination with ACP and SHP impacts for comparison with the NAAQS.

4.11.1.2 Air Quality Regulatory Requirements

New Source Review

New Source Review (NSR) is a preconstruction permitting program designed to protect air quality when air pollutant emissions are increased either through the modification of existing stationary sources or through the construction of a new stationary source of air pollution. Proposed new or modified air pollutant emissions sources must undergo a NSR permitting process prior to construction or operation. Through the NSR permitting process, federal, state, and local regulatory agencies review and approve project construction plans, and regulate pollutant increases or changes, emissions controls, and other details. The agencies then issue construction permits that include specific requirements for emissions control equipment and operating limits. PSD could potentially apply to stationary emissions sources, such as compressor stations, but does not apply to pipeline operation. PSD regulations were not designed to prevent sources from increasing emissions, but to protect public health and welfare and air quality in national parks, wilderness areas, and other areas of national or regional recreational, scenic, or historic value. PSD regulations also ensure that any decision to permit increased air pollution in any area to which these regulations apply is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decision-making process.

In areas with good air quality, NSR ensures that the new emissions do not degrade the air quality, which is achieved through the implementation of the PSD permitting program or state minor permit programs. In areas with poor air quality, Nonattainment NSR (NNSR) ensures that the new emissions do

[36] These GWPs are based on a 100-year time period. We have selected their use over other published GWPs for other timeframes because these are the GWPs that the EPA has established for reporting of GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

not inhibit progress toward cleaner air. The review process aids in preventing new sources from causing existing air quality to deteriorate beyond acceptable levels.

ACP's proposed new Compressor Stations 1, 2, and 3 would be subject to a PSD major source threshold of 250 tons per year (tpy). For each pollutant that triggers PSD, a Best Available Control Technology (BACT) analysis and detailed dispersion modeling must be performed. Table 4.11.1-7 provides the potential operational emissions for ACP compressor stations. Because emissions of criteria pollutants would not exceed 250 tpy, ACP would not trigger PSD requirements.

A modification to an existing major source is considered major if it results in a net emissions increase that exceeds the following thresholds: 40 tpy for NO_x and SO_2; 100 tpy for CO; 25 tpy for PM; 15 tpy for PM_{10}; and 10 tpy for $PM_{2.5}$. For ozone, the major modification threshold is 40 tpy of precursors VOC or NO_x.

Table 4.11.1-9 provides the potential operational emissions for SHP compressor stations. Potential operational emissions from the existing Crayne and JB Tonkin Compressor Stations after the proposed modifications would remain below PSD major source thresholds; therefore, these stations would not be subject to PSD regulations.

DETI's existing Mockingbird Hill, Hastings, and Lewis Wetzel Compressor Stations currently operate under a single Title V Operating Permit. The potential-to-emit emissions from these existing compressor stations combined exceed 250 tpy for NO_x and VOCs and is, therefore, a major source under PSD. Modifications to these facilities must be analyzed to determine whether any would be a major PSD modification. Table 4.11.1-2 provides the potential emission increases associated with the proposed modifications at the existing Mockingbird Hill Compressor Station, and the proposed nonjurisdictional modification at the existing Hastings Compressor Station.

TABLE 4.11.1-2

Mockingbird Hill and Hastings Compressor Station Emission Increases (tons per year)

Proposed Action	NO_X	CO	VOC	SO_2	Total PM_{10} / $PM_{2.5}$	CO_2e
Mockingbird Hill Expansion	55.5	58.6	17.3	5.17	30.6	197,797
Hastings Replacement Engines	8.6	17.2	6.1	0.02	1.65	5,182
Total	64.1	75.8	23.4	5.2	32.3	202,979
PSD Threshold	40	100	40	40	15/10	75,000
Significant Increase?	**Yes**	No	No	No	**Yes**	**Yes**

Based on table 4.11.1-2 above, emissions of NO_x, CO_2e, PM_{10}, and $PM_{2.5}$ would exceed the major source modification thresholds, triggering PSD. The next phase of PSD applicability is to consider contemporaneous changes at the site. Because the Mockingbird Hill, Hastings, and Lewis Wetzel Compressor Stations are permitted as a single source, contemporaneous emissions changes from all facilities were considered. DETI considered three past projects in its review of contemporaneous emissions changes:

- construction of the Lewis Wetzel Compressor Station (additional 19.6 tpy of NO_x);
- modification of the dehydration unit and associated equipment at the Hastings Compressor Station (reduction of 1.03 tpy of NO_x); and
- the planned replacement of two the two reciprocating engines at the Hastings Compressor Station (reduction of 194 tpy of NO_x).

The three past projects combined would result in a decrease of about 176 tpy in NO_x emissions. When considered with the proposed modification under SHP, which alone would increase the existing NO_x emissions by 55.5 tpy, the total net NO_x emissions at the site would be reduced by 112 tpy. PSD applicability for the Mockingbird Hill Compressor Station is shown in table 4.11.1-3 below.

TABLE 4.11.1-3

Prevention of Significant Deterioration Determination for the Mockingbird Hill Compressor Station

	NO_X	CO	VOC	SO_2	$PM/PM_{10}/PM_{2.5}$	CO_2e
	(tons per year)					
Mockingbird Hill (Wetzel County, West Virginia)	55.5	58.6	17.3	5.17	30.6	197,797
Other Contemporaneous Changes	(167)					
Significant Net Emissions Increase	(112)					
PSD Threshold (Major Modification)	40.0	100.0	40.0	40.0	25.0/15.0/10.0	75,000 [a]
Significant Increase?	No	No	No	No	**Yes**	**Yes** [a]

[a] Only after another pollutant triggers PSD.

When considering contemporaneous emissions changes, the modifications at the Mockingbird Hill Compressor Station would be minor. However, based on table 4.11.1-3, the net emissions increase of PM, PM_{10}, $PM_{2.5}$, and GHGs would still exceed the major modification thresholds, representing a significant net emissions increase. Therefore, a BACT analysis is required per PSD regulations.

GHG BACT Analysis

The GHG BACT analysis for the Mockingbird Hill Compressor Station included review of the following technologies and practices:

- carbon capture from the turbine stacks and permanent sequestration (CCS);
- selection of natural gas compression process efficiency improvements;
- selection of low carbon fuel; and/or
- good combustion/operating practices (to optimize operating efficiency).

DETI determined that carbon capture and sequestration was deemed technically infeasible due to the need for high voltage power transmission lines and additional electrical load to operate a CCS system. The additional power requirements would also increase CO_2 emissions. An increased footprint at the site would be required to facilitate CCS technology (which could include an amine scrubber). The turbines would be unable to provide the required horsepower due to increased backpressure.

In its permit application, DETI states that it would implement the remaining three practices listed above. Installation of the proposed combustion engine, as opposed to multiple smaller reciprocating engines, constitutes the most efficient compressor drive. Pipeline quality natural gas, which has the lowest GHG emissions compared to other fossil fuels, would be used to fuel the combustion turbines. Good combustion and operating practices include proper maintenance and monitoring, as well as automatic controls via computer systems that routinely adjust turbine operations to maintain safe and high efficiency operation.

Particulate Matter BACT Analysis

DETI evaluated BACT for PM_{10} and $PM_{2.5}$ as part of its application for the Mockingbird Hill Compressor Station. DETI indicates that it would utilize pre-combustion control technologies, including

clean-burning, low sulfur fuels, good combustion practices, and high efficiency filtration of the combustion turbine inlet system, to control particulate matter emissions.

DETI analyzed post-combustion control technologies, including cyclones/centrifugal collectors, fabric filters/baghouses, electrostatic precipitators, and scrubbers. These technologies are more effective at removing larger particles (10 microns or larger) and would not be efficient at removal of $PM_{2.5}$. During the air permitting process, the WVDEP would evaluate whether DETI's BACT analysis is appropriate and complete.

Federal Class I Areas

During the PSD review process, the potential impact of a project on protected Class I areas must also be considered. Federal Class I areas are designated as pristine natural areas or areas of natural significance, including national parks and some FS wilderness areas, and are afforded special protection under the CAA. If a facility is subject to PSD requirements and near a Class I area, the facility is required to notify the appropriate federal officials and assess the impacts of the facility on the Class I area to ensure pristine air quality is maintained.

The Mockingbird Hill Compressor Station is approximately 70 miles (about 113 kilometers) northeast of the Otter Creek Wilderness Class I area and 80 miles (about 129 kilometers) northeast of the Dolly Sods Wilderness Class I area. Both wilderness areas are managed by the FS. Because the Mockingbird Hill Compressor Station is more than 100 kilometers away from these Class I areas, an assessment of the impact on these Class I areas is not required. However, the WVDEP may be responsible for notifying the federal land manager and determining any needed additional analysis, as part of the PSD permitting process.

The NPS requested that Atlantic and DETI analyze the impacts of ACP and SHP on the Shenandoah National Park in Virginia, because Compressor Station 2 would be sited within the state (Buckingham County). While Compressor Station 2 would be within 100 kilometers of the Shenandoah National Park, because it would be a minor source under PSD, an air quality impacts analysis on the Shenandoah National Park is not required. Compressor Station 2 would also be within 100 kilometers of the James River Face Wilderness Area. This station would be a minor source under PSD regulations, and an air quality impacts analysis on this area would not be required.

The remaining ACP and SHP compressor stations would be minor sources of emissions under PSD regulations and would not be subject to the rule; therefore, an impacts analysis on nearby Class I areas is not required. As indicated above, pipelines are not considered stationary sources of emissions and are not subject to PSD regulations or impacts analyses on protected Class I areas.

Title V Operating Permitting

Title V is an operating permit program run by each state. The major source threshold level for an air emission source is 100 tpy for criteria pollutants in attainment areas. The major source hazardous air pollutant (HAP) thresholds for a source are 10 tpy of any single HAP or 25 tpy of all HAPs in aggregate. The EPA issued the Title V GHG Tailoring Rule, which established permitting requirements and thresholds for GHGs. On June 23, 2014, the U.S. Supreme Court ruled that a facility may not be required to obtain a Title V permit based solely on GHG emissions; however, if a facility is a major stationary source based on the potential-to-emit of other regulated pollutants, a Title V permit may include permit requirements for GHGs.

The potential-to-emit at the new ACP compressor stations would be below the Title V thresholds and would not be subject to Title V.

For SHP, the existing Mockingbird Hill and JB Tonkin Compressor Stations are currently subject to Title V regulations and would remain Title V facilities after modification. The Crayne Compressor Station, authorized under a state operating permit, is a minor source under Title V and would remain so after construction of SHP.

New Source Performance Standards

The EPA promulgates NSPS that establish emission limits and fuel, monitoring, notification, reporting, and recordkeeping requirements for new or significantly modified stationary source types or categories. NSPS Subpart JJJJ (*Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*) sets emission standards for NO_X, CO, and VOC. Subpart JJJJ would apply to the emergency generators at each of the new and modified ACP and SHP compressor and M&R stations. Atlantic and DETI would comply with all applicable requirements of Subpart JJJJ. Subpart KKKK, *Standards of Performance for Stationary Combustion Turbines*, regulates emissions of NO_X and SO_2. This subpart would apply to the new and modified compressor units installed at ACP and SHP compressor stations. Atlantic and DETI would be required to comply with applicable emission limits and monitoring, reporting, and testing requirements of this subpart.

National Emission Standards for Hazardous Air Pollutants

The CAA Amendments established a list of 187 HAPs, resulting in the promulgation of National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP). NESHAPs regulate HAP emissions from stationary sources by setting emission limits, monitoring, testing, recordkeeping, and notification requirements. Subpart ZZZZ (*National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*) would apply to the emergency electrical power generators at each compressor station. Atlantic and DETI would be subject to all applicable Subpart ZZZZ monitoring, recordkeeping, and reporting requirements and/or would comply with NESHAPs Subpart ZZZZ by complying with NSPS Subpart JJJJ requirements.

On May 12, 2016, the EPA issued three final rules, including the *Final Updates to New Source Performance Standards* and *Final Source Determination Rule*, that together will curb emissions of CH_4, smog-forming VOCs, and toxic air pollutants from new, reconstructed, and modified oil and gas sources. The final rules limit CH_4 emissions from oil and gas sources. For example, owners/operators are required to monitor and repair leaks on an established schedule to limit fugitive emissions, and emissions limits have been established for certain natural gas facilities. Regarding natural gas transmission facilities, compressor station owner/operators are required to develop a leak monitoring plan and use an optical gas imaging (or an alternate EPA method, "Method 21") to conduct leak surveys. On October 20, 2016, the EPA also issued its *Control Techniques Guidelines for the Oil and Natural Gas Industry* to inform state, local, and tribal agencies on what constitutes reasonably available control technology. Atlantic and DETI would be required to comply with all applicable standards and requirements set forth by these final rules.

General Conformity

The General Conformity Rule was developed to ensure that federal actions in nonattainment and maintenance areas do not impede states' attainment of the NAAQS. A conformity determination must be conducted by the lead federal agency if a federal action's construction and operation activities are likely to result in generating direct and indirect emissions that would exceed the conformity applicability threshold level of the pollutant(s) for which an air basin is designated as nonattainment or maintenance. Conforming activities or actions should not, through additional air pollutant emissions:

- cause or contribute to new violations of the NAAQS in any area;
- increase the frequency or severity of any existing violation of any NAAQS; or
- delay timely attainment of any NAAQS or interim emission reductions.

The General Conformity Rule entails both an applicability analysis and a subsequent conformity determination, if applicable. According to the conformity regulations, emissions from sources that are subject to any NNSR or PSD permitting/licensing (major or minor) are exempt and are deemed to have conformed. A General Conformity Determination must be completed when the total direct and indirect emissions of a project would equal or exceed the specified pollutant thresholds on a calendar year basis for each nonattainment or maintenance area.

For the proposed projects, all non-permitted emissions that would occur within a nonattainment area were considered in the general conformity applicability analysis.[37] Table 4.11.1-4 provides the results of the general conformity applicability review for ACP and SHP. Based on these results, the operational emissions that would occur in nonattainment or maintenance areas would not exceed the general conformity applicability thresholds for any criteria pollutant in a single calendar year. Therefore, general conformity does not apply to ACP or SHP. Likewise, construction emissions occurring in nonattainment counties would be below the applicable *de minimis* levels; therefore, a general conformity analysis is not required.

TABLE 4.11.1-4

General Conformity Applicability Analysis for the Atlantic Coast Pipeline and Supply Header Project

		NO_X	VOC	SO_2	$PM_{2.5}$
County (State)	Nonattainment Pollutant	(tons per year)			
Calendar Year 2018					
	Southwest Pennsylvania Interstate Air Quality Control Region				
Greene (PA)	$PM_{2.5}$ 24-hr (2006)	9.72	1.71	0.0015	3.61
Westmoreland (PA)	Ozone 8-hr (2008) $PM_{2.5}$ 24-hr (2006)	77.9	13.2	0.139	25.8
Air Region Total		**87.6**	**14.9**	**0.154**	**29.4**
	PA General Conformity de minimis	*100*	*50*	*100*	*100*
	Steubenville-Weirton-Wheeling Interstate Air Quality Region				
Marshall (WV)	SO_2 24-hr (2010)	N/A	N/A	0	N/A
Air Region Total		**N/A**	**N/A**	**0**	**N/A**
Calendar Year 2019					
	Southwest Pennsylvania Interstate Air Quality Control Region				
Greene (PA)	$PM_{2.5}$ 24-hr (2006)	7.95	1.40	0.012	2.96
Westmoreland (PA)	Ozone 8-hr (2008) $PM_{2.5}$ 24-hr (2006)	11.2	1.89	0.017	3.30
Air Region Total		**19.2**	**3.28**	**0.029**	**6.26**
	PA General Conformity de minimis	*100*	*50*	*100*	*100*
Marshall (WV)	SO_2 24-hr (2010)	N/A	N/A	0.010	N/A
Air Region Total		**N/A**	**N/A**	**0.010**	**N/A**
	WV General Conformity de minimis	*100*	*100*	*100*	*100*

N/A = Not Applicable

[37] Atlantic and DETI provided estimated general conformity emissions and calculation in their FERC applications on September 18, 2015, and provided updated estimates on November 9, 2016, based on their new proposed construction schedules.

Mandatory Greenhouse Gas Reporting Rule

The EPA established the final Mandatory Greenhouse Gas Reporting Rule, requiring the reporting of operational GHG emissions from applicable sources that emit greater than or equal to 25,000 metric tons of CO_2e in 1 year. Recent additions to the Mandatory Reporting Rule effective for calendar year 2016 require reporting of GHG emissions generated during operation of natural gas pipeline transmission systems, which include blowdown emissions, equipment leaks, and vent emissions at compressor stations, as well as blowdown emissions between compressor stations.

Based on the emission estimates presented, actual GHG emissions from operation of each ACP and SHP compressor station, has the potential to exceed the 25,000 tpy reporting threshold for the Mandatory Reporting Rule. Therefore, Atlantic and DETI would likely be required to report GHG emissions from their respective facilities.

Although this rule does not apply to construction emissions, we have provided GHG construction and operational emission estimates, as CO_2e, for accounting and disclosure purposes in section 4.11.1.3 and tables 4.11.1-5 through 4.11.1-9.

State Regulations

Atlantic and DETI would be required to obtain an air quality permit from the applicable air permitting authority for each of the new and modified compressor stations. The process of obtaining the air permit involves the review and implementation of state regulations. Air quality rules for each state can be found in each state's respective codes as shown below:

- Pennsylvania: Pennsylvania Code (PA Code)
- West Virginia: West Virginia CSR
- Virginia: VAC
- North Carolina: NCAC

State air quality regulations that would establish emission limits or other restrictions in addition to those required under federal regulations are summarized below. Atlantic and DETI would comply with all applicable state air quality rules and regulations.

<u>Pennsylvania</u>

The air quality regulations for the Commonwealth of Pennsylvania are codified in Title 25, subpart C, Article III of the Pennsylvania Code (25 PA Code 121-145). DETI would modify two existing compressor stations in Westmoreland and Greene Counties, Pennsylvania as part of SHP.

These rules outline facility testing and monitoring requirements; prohibit visible off-site fugitive particulate matter emissions; establish requirements and exceptions for open burning; prohibit dispersion techniques designed to circumvent a violation of an air quality standard; and establish SO_2 limits for combustion units, among other things.

- General Provisions (25 PA Code 121): Contains provisions to provide for the control and prevention of air pollution, prohibits the use of stack heights exceeding good engineering practices or dispersion techniques to conceal or dilute emissions to circumvent violation of an air quality regulation.

- Prohibition of Certain Fugitive Emissions (25 PA Code 123.1): Prohibits the emission of fugitive air contaminants from non-exempted sources and requires facilities to minimize airborne particulate emissions.

- Fugitive Particulate Matter (25 PA Code 123.2): Prohibits visible particulate matters emissions outside of the facility's property.

- Particulate Matter Limits for Combustion Units (25 PA Code 123.11): Establishes particulate matter emissions from combustion sources to $3.6E^{-0.56}$ pounds per British thermal unit.

- Sulfur Compound Emissions for Combustion Units (25 PA Code 123.22): Establishes SO_2 limits from combustion units.

- Odor Emissions Limitations (25 PA Code 123.31): Prohibits the emission of malodorous air contaminants from any source if it is detectable outside the property line.

- Visible Emissions Limitations (25 PA Code 123.41): Establishes opacity limits for visible emissions.

- Construction, Modification, Reactivation and Operation of Sources (25 PA Code § 127): Establishes requirements and provisions for obtaining a Plan Approval from the PADEP, and requires the use of best available technology. This rule is applicable to the Crayne and JB Tonkin Compressor Stations.

- Stationary Sources of NO_x and VOCs (25 PA Code 129.91–129.95): Establishes Reasonably Available Control Technology (RACT) requirements for facilities that are major sources for NO_X and/or VOC. DETI will submit a written RACT proposal for each source of VOCs and NO_X at the facility to the PADEP and the EPA.

West Virginia

The air quality regulations for the State of West Virginia are codified in Title 45 of the CSR – Series 1 through 42. Atlantic would construct a new compressor station in Lewis County as part of ACP. In addition, DETI would modify two existing compressor stations in Wetzel and Marshall Counties as part of SHP; however, only activities at the Mockingbird Hill Compressor Station would result in a change in emission emitting equipment. Major rules potentially applicable to these facilities include:

- Control of Air Pollution from Combustion of Refuse (45 CSR 6): Establishes permits and requirements for the open burning of land clearing debris.

- Ambient Air Quality Standards (45 CSR 8): Establishes and adopts ambient air quality standards for criteria air pollutants.

- To Prevent and Control Air Pollution from the Emission of Sulfur Oxides (45 CSR 10): Establishes SO_2 emissions limits and monitoring/recordkeeping requirements.

- Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants (45 CSR 13): Establishes requirements for stationary source permits.

- Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the PSD (45 CSR 14): Establishes major source permit requirements (applicable to the Mockingbird Hill Compressor Station).

- Standards of Performance for New Stationary Sources (45 CSR 16): Establishes standards of performance for new stationary sources promulgated by the EPA.

- To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter (45 CSR 17): Establishes provisions to prevent and control particulate matter air pollution from materials handling, preparation, storage, and other sources (which includes roads) of fugitive particulate matter.

- Requirements for Operating Permits (45 CSR 30): Establishes operating permits under Title V of the CAA.

- Emission Standards for HAPs (45 CSR 34): Establishes and adopts national emission standards for HAPs and other regulatory requirements promulgated by the EPA.

Virginia

The air quality regulations for the Commonwealth of Virginia are codified in Title 9 of the VAC, Agency 5, State Air Pollution Control Board. Atlantic would construct a new compressor station in Buckingham County as part of ACP.

- General Provisions (9 VAC 5-20): Establishes provisions to secure and maintain all air quality levels in Virginia.

- Ambient Air Quality Standards (9 VAC 5-30): Establishes State ambient air quality standards and, depending on ambient air quality concentrations, may require air dispersion modeling.

- New and Modified Sources (9 VAC 5-50): Requires the owner/operator of a new or modified emission source to achieve compliance with all standards of performance prescribed under this chapter within 60 days of achieving maximum production rate, but no later than 180 days after initial startup. This rule also establishes recordkeeping and reporting requirements, and requires the use of BACT where applicable.

- Construction Permits (9 VAC 5-80-1100): A6 permitting must be completed before construction of a new source. The required Form 7 application forms and attachments will be included in the Commonwealth permit application to satisfy this requirement for the construction of sources at the facility.

- Emergency Generator General Permit (9 VAC 5-540): Requires installation of non-resettable hour metering devices, which shall be observed by the owner/operator no less than once per month, and recordkeeping requirements.

North Carolina

Atlantic would construct a new compressor station in Northampton County as part of ACP. The following North Carolina Air Quality regulations would apply to the project.

- Construction and Operation Permits (15A NCAC 02Q): Establishes authority to require air quality permits.

- SO_2 Emissions from Combustion Sources (15A NCAC 02D .0516): Establishes limits for SO_2 from combustion sources that discharge into the atmosphere to 2.3 pounds per million Btu input (unless subject to NSPS or maximum achievable control technology [MACT] SO_2 standards).

- Control of visible emissions (15A NCAC 02D .0521): Limits the opacity from newly constructed combustion sources to 20 percent opacity (unless subject to NSPS or MACT opacity standards).

- Excess Emissions Reporting and Malfunctions (15A NCAC 02D .0535): Establishes state-specific requirements for a malfunction and reporting requirements.

- Particulates from Fugitive Dust Emissions Sources (15A NCAC 02D.0540): Requires operators to obtain a permit or subjects facilities to certain requirements which state that the facility shall not cause or allow fugitive dust emissions to cause or contribute to substantive complaints.

- Monitoring, Recordkeeping, and Reporting (15A NCAC 02D.0600): Establishes general requirements for monitoring, recordkeeping, and reporting.

- VOCs (15A NCAC 02D.0958): Establishes requirements for VOC emitting sources.

4.11.1.3 Air Emission Impacts and Mitigation

Construction Emissions

Air emissions would be generated during construction of the new mainline and lateral pipelines, modifications at four existing compressor stations, construction of three new compressor stations, and construction of ten new M&R stations.

Construction of ACP and SHP would result in temporary increases of pollutant emissions from the use of diesel- and gas-fueled equipment, blowdown and purging activities, open burning, as well as temporary increases in fugitive dust emissions from earth/roadway surface disturbance. Indirect emissions would be generated from vehicles associated with construction workers traveling to and from work sites. Fugitive dust would result from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. Emissions would be greater during dry periods and in areas of fine-textured soils subject to surface activity. The volume of fugitive dust generated would be dependent upon the area disturbed and the type of construction activity, along with the soil's silt and moisture content, wind speed, precipitation, roadway characteristics, and the nature of vehicular/equipment traffic. We received comments stating that fugitive dust should be controlled during construction of ACP and SHP. Atlantic and DETI would implement measures from their *Fugitive Dust Control and Mitigation Plan* to limit fugitive dust emissions. Measures in this plan include, but are not limited to: application of water or other dust suppressant on unpaved roads, soil stockpiles, and workspaces; enforcing a 15 mile per hour speed limit on

the right-of-way and access roads; and restoration of disturbed areas as soon as practicable. We reviewed the *Fugitive Dust Control and Mitigation Plan* and find it acceptable.

Fugitive particulate emissions of PM_{10} and $PM_{2.5}$ were calculated using the EPA AP-42 recommended emission factors for heavy construction equipment, combined with estimates of the extent and duration of active surface disturbance during construction. These emission factors tend to be conservative and can overestimate potential fugitive dust generated by the projects. Combustion emissions from on-road vehicles (e.g., delivery and material removal vehicles) were estimated using the EPA Motor Vehicle Emission Simulator model, which estimates emissions for on-road and non-road vehicles and equipment. Combustion emissions from non-road construction equipment operation were estimated using emission factors generated by EPA Motor Vehicle Emission Simulator based on the anticipated types of non-road equipment and their associated levels of use.

Atlantic and/or DETI contractors may use open burning to dispose of construction debris as described in the *Timber Removal Plan*, *Fire Plan*, and *Open Burning Plan*, except on NFS land where burning is prohibited. No open burning is proposed along TL-636, AP-2, AP-3, AP-4, or AP-5. Open burning would potentially occur along sections of the AP-1 mainline and TL-635 pipeline loop. Atlantic and DETI anticipate that no more than 8 to 12 percent of cleared timber would be burned.

Table 4.11.1-5 provides estimated construction emissions for ACP and SHP. [38]

TABLE.4.11.1-5

Estimated Construction Emissions for the Atlantic Coast Pipeline and Supply Header Project

	NO_X	CO	VOC	SO_2	PM	PM_{10}	$PM_{2.5}$	CO_2
Source	(total tons during construction activities)							
Emissions from Construction Equipment and Open Burning								
ACP Compressor Stations	91.4	58.2	14.1	0.113	9.34	9.34	9.06	19,591
SHP Compressor Stations	73.3	48.7	11.5	0.091	7.71	7.71	7.48	15,748
M&R Stations	28.6	15.6	4.03	0.040	2.57	2.57	2.49	6,970
Pipeline Spread	4,266	4,257	868	5.08	633	627	613	928,262
Estimated Tailpipe Emissions from Vehicles Used by Commuting Construction Workers								
ACP Compressor Stations	3.91	55.0	2.97	0.054	0.231	0.231	0.131	6,602
SHP Compressor Stations	1.62	23.3	1.19	0.022	0.097	0.097	0.055	2,504
M&R Stations	3.38	33.1	1.12	0.035	0.213	0.213	0.156	5,918
Pipeline Spread	44.8	620	45.4	0.735	2.41	2.41	1.20	122,885
Estimated Fugitive Emissions of Particulate Matter from Material Transfers and Road Traffic								
ACP Compressor Stations	-	-	-	-	583	198	34.9	-
SHP Compressor Stations	-	-	-	-	247	86.6	14.7	-
M&R Stations	-	-	-	-	424	138	25.2	-
Pipeline Spread	-	-	-	-	16,943	6,994		-
Total Emissions	**4,513**	**5,111**	**948.3**	**6.17**	**18,853**	**8,066**	**1,817**	**1,108,480**

Construction of ACP and SHP would take place over 2 years. Construction at aboveground facilities and the use of construction support areas would occur over several months at specific locations. Most construction related emissions would be temporary and localized, and would dissipate with time and distance from areas of active construction. Further, construction emissions along the pipelines would subside once construction is complete. Following construction at the compressor stations, emissions would

[38] Detailed emission calculations were provided in Atlantic's and DETI's applications each filed on September 18, 2015, and Atlantic's supplemental filing dated July 1, 2016 (Accession No. 20160701-5255). These detailed emissions calculations can be found on the FERC eLibrary website.

transition to operating emissions. Based on the mitigation measures outlined in Atlantic's and DETI's *Fugitive Dust Control and Mitigation Plan* and the temporary nature of construction, we conclude that construction of ACP and SHP would not have a significant impact on air quality. However, to further minimize construction emissions, Atlantic and DETI could implement measures such as enforcing idling time limits, utilizing clean diesel through add-on technologies, and using newer equipment.

Atlantic and DETI provided estimated construction emissions associated with Atlantic's office building (located at Compressor Station 3) and headquarters office in Northampton, North Carolina and DETI's Hastings Compressor Station. Table 4.11.1-6 provides the construction emissions for the project-related non-jurisdictional facilities.

TABLE 4.11.1-6

Construction Emissions for Non-Jurisdictional Facilities

Facility	NO_X	CO	SO_2	PM_{10}/ $PM_{2.5}$	CO_2e
	(tons per year)				
Atlantic's Office Building and Headquarters	31.24	19.61	0.04	6.23	6,697.4
DETI's Hastings Compressor Station	0.62	0.28	N/A	0.1	197.06

Operation Emissions

Operation of the new and modified ACP and SHP compressor stations and M&R stations would result in air emission increases over existing emissions levels. The turbines at ACP and SHP compressor stations would incorporate SoLoNO$_X$ (i.e., dry low NO$_X$ or lean pre-mix) combustors to control NO$_X$ emissions. In addition, NO$_x$ emissions from the ACP combustion turbines would be further controlled by selective catalytic reduction technology. Typical air emissions sources and activities include the following:

- combustion turbine;
- emergency generator;
- boiler;
- accumulator tank;
- hydrocarbon waste tank;
- aqueous ammonia storage tank; and
- fugitive natural gas emissions.

Air pollutant emissions from operation of ACP proposed compressor stations were calculated using emissions factors from vendor data and the EPA's *Compilation of Air Pollutant Emission Factors* (*AP-42*). CO_2e emissions were calculated based upon Table A-1 of 40 CFR 98, subpart A. The potential-to-emit emissions resulting from the ACP compressor station and M&R stations and SHP compressor stations are summarized in tables 4.11.1-7, 4.11.1-8, and 4.11.1-9, respectively. The Natural Resources Defense Fund expressed concern with emissions from fugitive pipeline leaks and natural gas venting. Blowdown emissions and fugitive CH_4 emissions from natural gas piping leaks were estimated for each of the compressor and M&R stations and have been included in the total emissions listed below. Natural gas fugitive releases from pneumatic valves would be 13.5 tpy of CH_4; 13.5 tpy of CH_4 from valve sites (50 sites for ACP and SHP combined); and 52.0 tpy of CH_4 from pig launchers/receivers (11 sets for ACP and SHP combined). Natural gas fugitive leaks from valve sites, pigging operations, and pneumatic valves for ACP and SHP combined would be 1.86 tpy of VOC and 1,657 tpy of CO_2e.

TABLE 4.11.1-7

Potential Emissions by Compressor Station for the Atlantic Coast Pipeline

Compressor Station	NO_X	CO	VOC	SO_2	$PM/PM_{10}/PM_{2.5}$	CO_2e	HAPs
	(tons per year)						
Compressor Station 1[a] (Lewis County, West Virginia)	42.5	70.7	30.3	7.08	12.2	277,088	5.22
Compressor Station 2[b] (Buckingham County, Virginia)	50.2	95.2	32.7	7.33	43.9	323,736	5.63
Compressor Station 3 (Northampton County, North Carolina)	19.7	31.1	21.8	3.10	18.4	129,243	3.42

[a] ACP Kincheloe and SHP CNX M&R stations emissions are included in the emissions for Compressor Station 1, as the facilities would be collocated.

[b] The Woods Run M&R station emissions are included in the emissions for Compressor Station 2, as the facilities would be collocated.

TABLE 4.11.1-8

Potential Emissions by M&R Station for the Atlantic Coast Pipeline

M&R Station	NO_X	CO	VOC	SO_2	$PM/PM_{10}/PM_{2.5}$	CO_2e
	(tons per year)					
Brunswick M&R Station (Brunswick County, Virginia)	2.31	7.78	1.40	0.124	1.47	25,084
Greensville M&R Station (Greensville County, Virginia)	2.46	8.27	1.48	0.131	1.57	226,639
Long Run M&R Station (Randolph County, West Virginia)	17.47	16.33	1.95	0.100	1.29	20,978
Elizabeth River M&R Station (City of Chesapeake, Virginia)	0.039	0.304	0.159	0.000014	0.001	168
Fayetteville M&R Station Johnston County, North Carolina)	0.039	0.304	0.147	0.000014	0.001	157
Pembroke M&R Station (Robeson County, North Carolina)	0.039	0.304	0.227	0.000014	0.001	248
Smithfield M&R Station (Johnston County, North Carolina)	0.039	0.304	0.238	0.000014	0.001	259

TABLE 4.11.1-9

Proposed Emissions by Compressor Station for the Supply Header Project

Compressor Station	NO_X	CO	VOC	SO_2	$PM/PM_{10}/PM_{2.5}$	CO_2e
	(tons per year)					
JB Tonkin (Westmoreland County, Pennsylvania)	28.6	30.5	9.91	2.59	15.4	101,300
Crayne (Greene County, Pennsylvania)	11.3	9.35	8.05	1.08	6.36	44,297
Mockingbird Hill (Wetzel County, West Virginia)	55.5	58.6	17.3	5.17	30.6	197,797
Burch Ridge (Marshall County, West Virginia)	0	0	0.027	0	0	40.9

Air Quality Modeling

Atlantic and DETI performed air quality modeling analyses for each of the new and modified compressor stations. Background pollutant concentrations were estimated using existing ambient

monitoring data for the region. The background monitors were determined based on proximity and general representativeness of the monitoring sites to each of the ACP and SHP compressor stations. The background concentrations were combined with the model results and compared to the NAAQS. Atlantic and DETI modeled air quality impacts from their respective compressor stations using the EPA approved AERMOD Model (version 1518). We reviewed the modeling analyses and agree with these conclusions.

Atlantic Coast Pipeline

Atlantic used a screening meteorological dataset, MAKEMET version 15181, to create a site-specific set of worst-case meteorological conditions to be used as input for AERMOD, which was run in screening mode. The screening mode of AERMOD provides estimates for the worst case 1-hour concentrations of multiple sources using fully developed terrain and receptor data. Data were obtained from representative air quality monitoring stations to characterize the background air quality for each compressor station and are presented in table 4.11.1-10.

TABLE 4.11.1-10

Summary of Background Concentrations and Air Quality Monitoring Stations for the Atlantic Coast Pipeline

Facility	Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$) [a]	Station ID	Station Location
Compressor Station 1	NO_2	1-hour	67.68	421250005	Charleroi, PA
		Annual	16.92		
	CO	1-hour	1,145	540090011	Weirton-Steubenville, WV-OH
		8-hour	916		
	$PM_{2.5}$	24-hour	19	540330003	Clarksburg, WV
		Annual	9.1		
	PM_{10}	24-hour	33	540390010	Charleston, WV
Compressor Station 2	NO_2 [b]	1-hour	69.56	511611004	Roanoke, VA
		Annual	16.92	511650003	Harrisonburg, VA
	CO	1-hour	1,374	511611004	Roanoke, VA
		8-hour	1,259.5		
	$PM_{2.5}$	24-hour	17	510030001	Charlottesville, VA
		Annual	7.6		
	PM_{10}	24-hour	34	510870014	Richmond, VA
Compressor Station 3	NO_2	1-hour	80.84	510360002	Richmond, VA Charles County
		Annual	9.4		
	CO	1-hour	1,717.5	371830014	Raleigh-Durham, NC
		8-hour	1,374		
	$PM_{2.5}$	24-hour	18	510360002	Richmond, VA Charles County
		Annual	7.9		
	PM_{10}	24-hour	33	516700010	Hopewell, VA

[a] Background concentrations are the 2014 design values for all pollutants except for PM_{10}, which is the maximum value over the 2012-2014 period.

[b] Compressor Station 2: Annual NO_2 background value is represented using the Harrisonburg, VA monitor, which is the closest NO_2 monitor to the site. However, 1-hour NO_2 values are not available for this site, and so the next closest station in Roanoke, VA is used for the 1-hour value.

$\mu g/m^3$ = $\mu g/m^3$ = microgram per cubic meter

All equipment at the compressor stations would be permitted to operate for up to 8,760 hours per year except for the emergency generators, which would be operated not more than 100 hours a year for

non-emergency use (e.g., testing and maintenance). The emergency generators have no hourly limit on emergency operations. Atlantic modeled the reduction of operational hours for the emergency generators by using an annualized emission rate instead of a short-term emission rate for NO_X and $PM_{2.5}/PM_{10}$ modeling. CO was modeled using short-term emission rates for all sources.

Table 4.11.1-11 provides the results of the modeling analyses for the compressor stations associated with ACP, including the compressor station impact, the combined ambient and station concentrations, and a comparison with the NAAQS.

TABLE 4.11.1-11

Air Quality Model Results for the Atlantic Coast Pipeline

Facility	Pollutant	Averaging Period	Background Concentration (µg/m^3)	Model Result (µg/m^3)	NAAQS (µg/m^3)	Background + Model Concentration (µg/m^3)
Compressor Station 1	NO_2	1-hour	67.7	19.7	188	87.4
		Annual	16.9	1.8	100	18.8
	CO	1-hour	1,145	3,708	40,000	4,853
		8-hour	916	3,337	10,305	4,253
	$PM_{2.5}$	24-hour	19	15.0	35	34.0
		Annual	9.1	2.49	12	11.59
	PM_{10}	24-hour	33	15.0	150	48.0
Compressor Station 2	NO_2	1-hour	69.6	83.3	188	152.9
		Annual	16.9	7.8	100	24.7
	CO	1-hour	1374	196.0	40,000	1,570.0
		8-hour	1,259.5	176.4	10,305	1,435.9
	$PM_{2.5}$	24-hour	17	11.7	35	28.7
		Annual	7.6	1.9	12	9.5
	PM_{10}	24-hour	34	11.7	150	45.7
Compressor Station 3	NO_2	1-hour	80.8	37.9	188	118.8
		Annual	9.4	3.6	100	13.0
	CO	1-hour	1,717.5	3,951	40,000	5,668
		8-hour	1,374	3,556	10,305	4,930
	$PM_{2.5}$	24-hour	18	6.0	35	24.0
		Annual	7.9	1.0	12	8.9
	PM_{10}	24-hour	33	6.0	150	39.0

µg/m^3 = microgram per cubic meter

As demonstrated in table 4.11.1-11 above, ACP compressor stations would not cause or contribute to a violation of the NAAQS.

Supply Header Project

The air quality modeling analyses for SHP were conducted using the most recent version of the EPA regulatory air dispersion model, AERMOD version 15181. All the existing and newly proposed equipment were included in the modeling analyses to determine each facility's cumulative impact to the surrounding air quality.

Background values for 1-hour NO_2 were determined using the third highest average background value over a 3-year period, between 2010-2013, averaged by season and hour of day. This method is in accordance with EPA guidance. All other pollutants and averaging periods used the 2014 design value for

the background concentrations, except for PM_{10}, which used the maximum value over the 2012-2014 period.

Data were obtained from representative air quality monitoring stations to characterize the background air quality for each compressor station and are presented in table 4.11.1-12.

TABLE 4.11.1-12

Summary of Background Concentrations and Air Quality Monitoring Stations for the Supply Header Project

Facility	Pollutant	Averaging Period	Background Concentration (µg/m^3) [a]	Station ID	Station Location
JB Tonkin Compressor Station	NO_2 [b]	1-hour	Hourly/Seasonal	420031005	Natrona Heights, PA
		Annual	16.92	421250005	Charleroi, PA
	CO	1-hour	3,091.5	420030008	Lawrenceville, PA
		8-hour	1,603		
	$PM_{2.5}$	24-hour	22	420031008	Natrona Heights, PA
		Annual	10		
	PM_{10}	24-hour	43	420030003	Monroeville, PA
Crayne Compressor Station	NO_2	1-hour	Hourly/Seasonal	421250005	Charleroi, PA
		Annual	16.92		
	CO	1-hour	2,862.5	421250005	Charleroi, PA
		8-hour	916		
	$PM_{2.5}$	24-hour	21	421250200	Washington, PA
		Annual	10		
	PM_{10}	24-hour	54	421250005	Charleroi, PA
Mockingbird Hill Compressor Station	NO_2	1-hour	Hourly/Seasonal	421250005	Charleroi, PA
		Annual	16.92		
	CO	1-hour	2,862.5	421250005	Charleroi, PA
		8-hour	916		
	$PM_{2.5}$	24-hour	19	540490006	Fairmont, WV
		Annual	9.7		
	PM_{10}	24-hour	54	421250005	Charleroi, PA

[a] Background concentrations are the 2014 design values for all pollutants except for PM_{10}, which is the maximum value over the 2012-2014 period, and 1-hour NO_2. 1-hour NO_2, values were determined using the 3rd highest average background value over the 2010-2013 period, averaged by season and hour of day.

[b] JB Tonkin Compressor Station: 1-hour NO_2 background values are variable and are represented using the Natrona Heights, PA monitor, which is the closest NO_2 monitor to the site. However, a 2014 annual NO_2 design value is not available for this site, and so the next closest station with a 2014 annual design value is in Charleroi, PA.

All equipment at the compressor stations would be permitted to operate for up to 8,760 hours per year except for the emergency generators. The existing emergency generators are currently permitted to operate not more than 500 hours a year, while new emergency generators would operate not more than 100 hours a year for non-emergency use (e.g., testing and maintenance). The emergency generators have no hourly limit on emergency operations. DETI modeled the reduction of operational hours for the emergency generators by using an annualized emission rate instead of a short-term emission rate for NO_X and $PM_{2.5}/PM_{10}$ modeling. CO was modeled using short-term emission rates for all sources.

Table 4.11.1-13 below provides the results of the modeling analyses for the compressor stations associated with SHP, including the compressor station impact, the combined ambient and station concentrations, and a comparison with the NAAQS.

TABLE 4.11.1-13

Air Quality Model Results for the Supply Header Project

Facility	Pollutant	Averaging Period	Background Concentration (µg/m^3) [a]	Model Result (µg/m^3)	NAAQS (µg/m^3)	Background + Model Concentration (µg/m^3)
JB Tonkin Compressor Station	NO_2 [b]	1-hour	Hourly/Seasonal	116.7	188	163.7
		Annual	16.92	6.8	100	23.7
	CO	1-hour	3091.5	3,228	40,000	6,319
		8-hour	1603	1842	10,305	3,445
	$PM_{2.5}$	24-hour	22	2.2	35	24.2
		Annual	10	0.5	12	10.5
	PM_{10}	24-hour	43	2.9	150	45.9
Crayne Compressor Station	NO_2	1-hour	Hourly/Seasonal	45.5	188	90.0
		Annual	16.92	2.3	100	19.2
	CO	1-hour	2862.5	106.4	40000	2,969
		8-hour	916	50.1	10305	966
	$PM_{2.5}$	24-hour	21	1.5	35	22.5
		Annual	10	0.3	12	10.3
	PM_{10}	24-hour	54	2.7	150	56.7
Mockingbird H ill C ompressor Station	NO_2	1-hour	Hourly/Seasonal	117.1	188	164.2
		Annual	16.92	13.3	100	30.2
	CO	1-hour	2862.5	7,536	40,000	10,398
		8-hour	916	4,623	10,305	5,539
	$PM_{2.5}$	24-hour	19	5.1	35	24.1
		Annual	9.7	1.2	12	10.9
	PM_{10}	24-hour	54	7.6	150	61.6

[a] Background concentrations are the 2014 design values for all pollutants except for PM_{10}, which is the maximum value over the 2012-2014 period, and 1-hour NO_2. 1-hour NO_2, values were determined using the 3rd highest average background value over the 2010-2013 period, averaged by season and hour of day.

[b] JB Tonkin Compressor Station: 1-hour NO_2 background values are variable and are represented using the Natrona Heights, PA monitor, which is the closest NO_2 monitor to the site. However, a 2014 annual NO_2 design value is not available for this site, and so the next closest station with a 2014 annual design value is in Charleroi, PA.

As demonstrated in table 4.11.1-13 above, SHP compressor stations would not cause or contribute to a violation of the NAAQS.

We received a request to consider conducting a health impact assessment. Air quality is discussed throughout section 4.11, and the modeling analyses for the compressor stations associated with ACP and SHP demonstrated that the impacts from the new compressor facilities, when combined with the existing background levels, would remain in compliance with the NAAQS, which were established by the EPA to be protective of human health, including children, the elderly, and sensitive populations. The NAAQS criteria pollutants are implemented and enforced by the states in which the project facilities would be constructed and operated. The EPA has also established standards for HAP emissions for specific source categories under the CAA. The projects' facilities would be designed, constructed, and operated in compliance with these applicable standards and regulations. Therefore, we conclude that a health impact assessment is not required.

We received comments indicating that harmful, toxic chemicals would be released into the atmosphere during blowdown events. Blowdown events could occur at valve sites and pig launcher/receiver sites during operation of ACP and SHP pipelines. Blowdown events would also occur at compressor stations. Blowdowns at valve sites would be infrequent and would last approximately 5 to 20 minutes. Natural gas (methane/CH_4) is released during blowdown events. Methane, a GHG, is lighter than air and rises into the atmosphere. Methane is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. However, when released into the atmosphere (as opposed to a confined space), sufficient air mixing would occur to negate this hazard. Noise impacts associated with blowdown events are discussed in section 4.11.2.2.

4.11.1.4 Radon Exposure

We received comments about the potential exposure to released radon gas. We have recently evaluated general background information, studies, and literature on radon in natural gas in several past project EISs.[39] These studies include samples taken at well sites, pre-processing, post processing, and transmission pipelines and the recent PADEP's Technologically Enhanced Naturally Occurring Radioactive Materials Study Report issued in January 2015 (PADEP, 2016b). This PADEP report is consistent with past studies, which identify indoor radon concentrations ranging from 0.0042 picocuries per liter to 0.13 picocuries per liter.

The EPA has set the indoor action level for radon at 4 picocuries per liter. If concentrations of radon are high enough to exceed these activity levels, the EPA recommends implementing remedial actions, such as improved ventilation, to reduce levels below this threshold. Further, the Indoor Radon Abatement Act established the long-term goal that indoor air radon levels be equal to or better than outdoor air radon levels. The average home in the United States has a radon activity level of 1.3 picocuries per liter, while outdoor levels average approximately 0.4 picocuries per liter. Past studies demonstrate that indoor radon concentrations from Marcellus Shale sourced gas would remain below the EPA action level and the Indoor Radon Abatement Act long-term goal. Therefore, we find that the risk of exposure to radon in natural gas is not significant.

Based on the estimated emissions from construction and operation of ACP and SHP facilities, Atlantic's and DETI's commitments to comply with the required federal and state regulations, and our review of the modeling analysis, we agree that the projects would result in continued compliance with the NAAQS, and conclude that ACP and SHP would not result in significant impact on local or regional air quality.

4.11.2 Noise

Construction and operation of ACP and SHP would affect overall noise levels in the project area. The ambient sound level of a region is defined by the total noise generated within the specific environment and is comprised of natural and man-made sounds. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of a day and throughout the week. This variation is caused in part by changing weather conditions and the effect of seasonal vegetation cover.

Two measurements used by some federal agencies to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level (L_{eq}) and the L_{dn}. The

[39] New Jersey-New York Expansion Project Final EIS (Docket No. CP11-56) issued March 2012; Rockaway Delivery Lateral and Northeast Connector Projects Final EIS (Docket Nos. CP13-36 and CP13-132) issued February 2014; and the Algonquin Incremental Market Project Final EIS (Docket No. CP14-96) issued January 2015.

L_{eq} is a sound level over a specific period corresponding to the same sound energy as measured for an instantaneous sound level assuming it is a constant noise source. Sound levels are perceived differently, depending on the length of exposure and time of day. The L_{dn} considers the time of day and duration the noise is encountered. Specifically, in calculation of the L_{dn}, late night and early morning (10:00 p.m. to 7:00 a.m.) noise exposures are increased by 10 dBA to account for people's greater sensitivity to sound during nighttime hours. Due to the 10 dBA nighttime penalty added prior to calculation of the L_{dn}, for a facility to meet the 55 dBA L_{dn} limit, the facility must be designed such that the constant 24-hour noise level does not exceed an L_{eq} of 48.6 dBA at any NSA. The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies.

Table 4.11.2-1 demonstrates the relative dBA noise levels of common sounds measured in the environment and industry. As a point of reference, a person's threshold of perception for a noticeable change in loudness is about 3 dBA, whereas a 5 dBA change is clearly noticeable, and a 10 dBA change is perceived as twice as loud.

TABLE 4.11.2-1

Sound Levels (dBA) and Relative Loudness

Description of Sound	Sound Level (dBA)
Threshold of pain	140
Jet taking off (200-foot distance)	130
Operating heavy equipment	120
Night club with music	110
Construction site	100
Boiler room	90
Freight train (100-foot distance)	80
Classroom chatter	70
Conversation (3-foot distance)	60
Urban residence	50
Soft whisper (5-foot distance)	40
North rim of Grand Canyon	30
Silent study room	20
Threshold of hearing (1,000 hertz)	0

Adapted from OSHA, 1999.

4.11.2.1 Noise Regulatory Requirements

Federal Regulations

In 1974, the EPA published its *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and used it to evaluate to potential noise impacts from the proposed projects at pre-existing NSAs such as schools, hospitals, and residences. In addition, Commission regulations state that operation of compressor stations may not result in any perceptible increase in vibration at any NSA.

State Regulations

There are no known state noise regulations applicable to ACP and SHP.

Local Regulations

Numerical local noise regulations are in place in Nelson County, Virginia, and Halifax and Cumberland Counties, North Carolina. There are no other known local noise regulations applicable to ACP and SHP.

Virginia

Some of the counties and cities in Virginia have ordinances that prohibit plainly audible noise from radios, televisions, loudspeakers, musical instruments, phonographs, or similar devices during nighttime periods at 50 feet from the building, structure, or vehicle in which the sound source is located (e.g., Buckingham County Noise Control Ordinance, Rev 10-9/12; Greenville County Noise Ordinance, Sec. 15-52 Ord. No. 90-02, 12-3-90; Amd. of 1-18-00; and City of Chesapeake noise ordinance, Sec. 26-124, Ord. No. 09-O-129, 11-24-09).

Aside from sound devices and amplification machines, the City of Chesapeake noise ordinance (Sec. 26-124[3]) also prohibits "construction, erection, demolition, alteration, repair, excavation or demolition work on public or private property, or in any building, structure, street, road, highway or alley" if conducted between the hours of 10:00 p.m. and 6:30 a.m. and if these activities generate plainly audible sound at 50 feet or more from the source of the noise.

In Nelson County, maximum permissible sound levels in residential areas are 65 decibels (dB) during the daytime (7:00 a.m. to 10:00 p.m.) and 55 dB at nighttime (10:00 p.m. to7:00 a.m.).

North Carolina

In Halifax County, sound levels of 55 dB during the daytime (7:00 a.m. to 11:00 p.m.) and 50 dB at nighttime (11:00 p.m. to 7:00 a.m.) are not permissible in residential areas.

In Cumberland County, there is a maximum permissible sound level of 60 dB during the daytime (6:00 a.m. to 10:00 p.m.) and 55 dB at nighttime (10:00 p.m. to 6:00 a.m.) for more than 5 minutes in residential areas or 10 percent of the sound level measurements, at 5-second intervals during a measurement period of at least 10 minutes, taken at or beyond the property boundary of the land use from which the sound emanates. Any source of sound that is the subject of a specific exemption or special permit shall not be permitted to exceed ambient sound levels by more than 15 dB.

4.11.2.2 Noise Level Impacts and Mitigation

Construction Noise Impacts and Mitigation

Noise would be generated during construction of the pipeline and the aboveground facilities for ACP and SHP. Noise levels would be highest in the immediate vicinity of construction activities and would diminish with distance from the work area. These impacts would be localized and temporary. The changing number and type of construction equipment at these sites would result in varying levels of noise. Construction activities associated with the projects would be performed with standard heavy equipment such as track-excavators, backhoes, cranes, bulldozers, dump trucks, boring equipment, and cement trucks. In addition, various powered pumps would be used to control water in the workspace or during hydrostatic testing activities. Noise would also be generated by trucks and other light vehicles traveling in and near areas under construction.

Pipeline construction would occur for approximately 10 hours per day (between the hours of 6:00 a.m. and 6:00 p.m.), 6 days per week, while aboveground facility construction would take place between the hours of 6:00 a.m. to 10:00 p.m. If necessary, 24-hour construction activities could occur at aboveground facilities, but would be limited to work inside station buildings (e.g., electrical work). HDD activities at all locations would occur on a 24-hour basis.

Surface topography, vegetation cover, wind, and weather conditions would also affect the distance that construction-related noise would extend from the workspace. Tall, dense vegetation and rolling topography typically attenuates noise when compared to less vegetated, open land. Typically, the most prevalent sound source during construction would be the internal combustion engines used to power the construction equipment. Table 4.11.2-1, above, provides relative loudness levels. Table 4.11.2-2, below, provides estimated noise levels (50 feet from the source) for typical construction equipment.

TABLE 4.11.2-2

Noise Levels of Major Construction Equipment [a]

Equipment Type	Sound Level at 50 Feet (dBA)
Trucks	85
Crane	85
Roller	85
Bulldozers	85
Pickup Trucks	55
Backhoes	80
Grader	85
Portable generators	84
Jackhammer	89
Pumps	81
Horizontal Boring Hydraulic Jack	82

[a] FHA, 2006.

Pipeline Construction

Construction equipment noise levels would typically be about 85 dBA at 50 feet when equipment is operating at full load, which could be heard by people in nearby buildings. However, most pipeline construction noise would be localized. Atlantic and DETI would construct their respective pipelines during daytime hours. Some discrete activities (e.g., hydrostatic testing, tie-ins, and purge and packing the pipeline) may require 24 hours of activity for limited periods of time, as would some HDD operations (see below). However, these activities would be short-term. Due to the temporary, transitory, and localized nature of pipeline construction, we conclude that pipeline construction noise would not have a significant impact on nearby landowners.

Sound generated by construction of the projects during daytime hours is exempt from compliance with the local ordinances in the project areas. To comply with other local noise ordinances, Atlantic would instruct the contractors to operate radios used during construction of ACP (e.g., radios in contractor vehicles) at low volumes in residential areas so that the radios would not be plainly audible at 50 feet from the source of the noise. With respect to the City of Chesapeake noise ordinance, if nighttime construction activity is required, Atlantic would apply to the City Manager in the City of Chesapeake for a special permit in accordance with section 26-142 of the City of Chesapeake noise ordinance.

Commenters expressed concern with construction noise impacts on construction workers and wildlife. Atlantic, DETI, and their contractors would adhere to the OSHA's laws and regulations to ensure a safe working environment. Construction-related safety and health regulations can be found at 29 CFR

1926. Section 1926.52, Occupational Noise Exposure, specifically addresses construction-related noise. During construction, mobile wildlife species would likely relocate away from the construction area to avoid the noise. Immobile species would be impacted; however, noise at any given location would be localized and temporary. Once construction is complete, noise levels would return to preconstruction levels. Additional noise impacts on wildlife are discussed in section 4.5.8.

HDD Operations

The ACP pipeline route includes 20 locations where Atlantic proposes to use the HDD construction method. HDD operations would generate noise at drill entry and exit points. HDD activities in any one area could last from several weeks to several months depending on the length of the drill and the hardness of the substrate being drilled. Atlantic estimates that the HDDs would take about 3 to 6 weeks at each location, except for the James River/Mayo Creek HDD (3 to 4 months) and the BRP/ANST HDD (12 to 14 months).

Typical equipment used at HDD entry sites includes:

- drilling rig and engine-driven hydraulic power unit;
- two triplex centrifugal main mud pumps and two engine-driven generator sets;
- mud mixing/cleaning equipment with five ditch pumps and three mud tank pumps;
- fluid system shale shaker;
- mobile equipment including a crane, backhoe, front loader, and boom truck; and
- five engine-driven light plants.

Noise associated with HDD exit sites could result from use of the following equipment:

- one triplex centrifugal main mud pump;
- mud tank with three pumps;
- backhoe and/or truck(s);
- welding;
- one electric-driven generator set; and
- five engine-driven light plants.

The results of Atlantic's HDD noise assessment are summarized in table 4.11.2-3. Additional NSAs are also present, in most cases farther from the noise-generating sources at the HDD entry/exit sites. In some instances, noise may be greater at NSAs slightly farther than the closest NSA due to topography, local vegetation patterns, proximity to both the entry and exit sites, and ACP's mitigation measures. The locations (NSAs) with the greatest estimated noise increase are presented below. There are no NSAs within 0.5 mile of the Roanoke River crossing and the exit sites for the South Branch Elizabeth River and Fishing Creek crossings. At the Roanoke River crossing, the nearest NSA to the entry point is 6,000 feet northwest, and the nearest NSA to the exit point is 6,100 feet west. To ensure that no NSAs would be impacted by the two new proposed HDDs, **we recommend that:**

- **<u>As part of its Implementation Plan</u>, Atlantic should file with the Secretary aerial photographs depicting the entry and exit sites for the proposed Interstate 79 and Route 58 HDDs. The aerials should identify any NSAs within 0.5 mile of the entry/exit sites for each HDD or clearly demonstrate that there are no NSAs within 0.5 mile of the entry/exit sites.**

TABLE 4.11.2-3

Estimated Noise Levels for Horizontal Directional Drill Entry and Exit Sites

HDD Entry and Exit Site	Nearest NSA[a]	Distance and Direction of NSA from Drill Site (feet)	Existing Ambient Sound Level (L_{dn}) dBA	Estimated Sound Level (L_{dn}) of the HDD[c] dBA	Estimated Total Sound Level (HDD L_{dn} + Ambient L_{dn}) dBA	Potential Increase above Ambient[c] dB
BRP/ANST Entry	S2	1,300 (NW)	57.4	40.5	57.5	0.1
BRP/ANST Entry[d]	S9	600 (WNW)	59.3	45.5[b]	59.5	0.2
James River/Mayo Creek Entry	S1	2,100 (WNW)	58.1	33.1	58.1	0.0
James River/Mayo Creek Exit	S2	1,000 (NNE)	57.0	28.0	57.0	0.0
Nottoway River Entry	S1	2,000 (SE)	45.6	33.6	45.9	0.3
Nottoway River Exit	S7	1,250 (ENE)	50.7	41.7	51.2	0.5
Blackwater River Entry	S5	600 (NW)	52.3	46.2[b]	53.3	1.0
Blackwater River Exit	S12	2,100 (SSW)	52.5	39.3	52.7	0.2
Lake Prince Entry	S4	500 (WNW)	47.8	49.8[b]	51.9	4.1
Lake Prince Exit	S11	625 (E)	47.8	51.9	53.4	5.6
Western Branch Reservoir Entry	S3	2,100 (W)	48.7	50.8	52.9	4.2
Western Branch Reservoir Exit	S7	1,100 (S)	56.4	38.1	56.5	0.1
Western Tributary to Nansemond River Entry	S2	2,000 (N)	49.7	38.4	50.0	0.3
Western Tributary to Nansemond River Exit	S3	500 (E)	55.9	51.8	57.3	1.4
Nansemond River Entry	S1	1,300 (NNE)	51.8	47.2	53.1	1.3
Nansemond River Exit	S3	2,500 (E)	54.2	34.0	54.3	0.1
Interstate 64 Entry	S1	225 (ENE)	61.5	52.9[b]	62.1	0.6
Interstate 64 Exit	S8	250 (SSE)	57.9	51.9[b]	58.9	1.0
Route 17 Entry	S5	225 (SSE)	59.9	**62.9**[b]	64.7	4.8
Route 17 Exit	S13	80 (S)	56.0	**59.5**[b]	61.1	5.1
South Branch Elizabeth River Entry	S1	2,300 (SSE)	55.6	52.6	57.4	1.8
South Branch Elizabeth River Exit	N/A	N/A	N/A	N/A	N/A	N/A
Cape Fear Alternate Entry	S2	750 (NW)	48.1	50.8	52.7	4.6
Cape Fear Alternate Exit	S3	2,300 (W)	48.9	44.8	50.3	1.4
Roanoke River Entry	N/A	N/A	N/A	N/A	N/A	N/A
Roanoke River Exit	N/A	N/A	N/A	N/A	N/A	N/A
Fishing Creek Entry	S3	1,600 (SW)	52.7	54.4	56.6	3.9
Fishing Creek Exit	N/A	N/A	N/A	N/A	N/A	N/A
Swift Creek Entry	S11	500 (SE)	46.7	**59.4**[b]	59.7	**13.0**
Swift Creek Entry	S13	650 (W)	46.3	**56.4**[b]	56.8	**10.1**
Swift Creek Exit	S14	500 (NW)	46.3	**59.4**[b]	59.6	**13.3**
Swift Creek Exit	S1	550 (SW)	47.1	47.5[b]	50.3	3.2
Tar River Entry	S2	2,450 (NE)	48.4	49.4	51.9	3.6
Tar Creek Exit	S7	800 (SSE)	47.5	51.5	53.0	5.5
Contentnea Creek Entry	S7	900 (SW)	46.8	53.4	54.3	7.5
Contentnea Creek Exit	S6	2,200 (SW)	46.8	45.4	49.2	2.4
Little River Entry	S4	1,900 (E)	46.3	50.4	51.8	5.6
Little River Exit	S8	1,200 (SE)	46.7	36.5	47.1	0.4

N/A = not applicable; i.e., no NSA within 0.5 mile of the HDD entry or exit site

[a] All NSAs listed in the table are residences.

[b] HDD noise estimates include the application of mitigation measures (i.e., a noise control barrier wall).

[c] Noise increases equal to or greater than 10 dBA above ambient or that would exceed the FERC level of 55 dBA L_{dn} are shown in **bold**.

[d] The HDD at the BRP would involve an "intercepting drill," which requires drilling on both ends of the HDD segment, resulting in two entry sites.

As indicated (in bold) in table 4.11.2-3, NSAs near the Route 17 and Swift Creek entry and exit sites are estimated to exceed the FERC's 55 dBA L_{dn} noise guideline at the nearest NSA. The HDD noise levels at these locations would range from 4.8 dBA to 13.3 dBA above ambient. In addition, NSAs S11, S13, and S14 near the Swift Creek entry site would experience a 10 dBA or greater increase in noise above ambient. Atlantic would install a noise control wall at these locations (which was taken into account in the noise estimates); however, these locations would still result in noise levels above the FERC guideline of 55 dBA, L_{dn}. Accordingly, Atlantic proposes to temporarily relocate landowners where noise levels exceed the FERC guideline. Atlantic would notify residents 1 month prior to the start of HDD operations, and would finalize temporary relocation plans 2 weeks prior to drilling. Relocation could last for the duration of the drill, approximately 3 to 6 weeks.

In addition, we received comments from the Fenton Inn that noise from HDD activities could impact its business. The Fenton Inn, which is identified as NSA S9 in table 4.11.2-3, is approximately 400 feet from the southeast BRP HDD entry point at the nearest structure based on the site-specific HDD drawing that has been filed by Atlantic. However, we note that Atlantic completed its noise analysis assuming the Fenton Inn was 600 feet from the HDD entry point (thus underestimating the noise impact at the Inn), and we have taken this discrepancy into consideration of our noise analysis. Atlantic proposes to install a noise barrier wall at the entry site near the Fenton Inn, as recommended by Atlantic's noise consultant. As a result, the increase in noise level experienced at the NSA would be below 3 dBA, or the threshold of noticeable difference. We also received comments from the Wintergreen Property Association indicating that its Gatehouse (approximately 600 feet away) and office building (approximately 900 feet away) were omitted as NSAs near the BRP HDD site. To ensure that the actual HDD noise levels are below our noise criterion at the Fenton Inn and the Gatehouse for the Wintergreen Property Owners Association, and that HDD noise levels do not significantly impact the NSAs near the Route 17 and Swift Creek entry and exit sites, **we recommend that**:

- **Atlantic should file in the <u>weekly construction status reports</u> the following for NSA S9, the Gatehouse, and the office building near BRP; the Route 17 HDD entry and exit sites; and NSAs S11, S13, and S14 near the Swift Creek entry site:**

    a. the noise measurements from these NSAs, obtained at the start of drilling operations;

    b. the noise mitigation that Atlantic implemented at the start of drilling operations; and

    c. any additional mitigation measures that Atlantic would implement if the initial noise measurements exceeded an L_{dn} of 55 dBA at the nearest NSA and/or increased noise is greater than 10 dBA over ambient conditions.

Operational Noise Impacts and Mitigation

Pipeline Facilities

Operation of the ACP and SHP pipelines would not typically cause noise impacts, except during pipeline blowdown events at valve sites and pig launcher/receiver sites. A blowdown involves the venting of natural gas from the pipeline or compressor station components into the atmosphere. Most blowdowns occur because of system testing or maintenance activities. Noise resulting from a planned blowdown event would be localized and short-term, lasting less than 10 minutes. Planned blowdowns as a result of certain

operations activities at valve sites would be infrequent and the associated noise level is estimated to be about 56 dBA at 1,000 feet from the valve or meter site. In addition, Atlantic would employ mobile blowdown silencers during each planned blowdown event to reduce noise to meet 85 dBA at 50 feet. Unplanned blowdowns because of emergency events are very infrequent and would be unsilenced to purge the pipeline as quickly as possible; the associated noise level of an emergency blowdown would be about 100 dBA at 1,000 feet from the valve or meter site.

Compressor Stations

The operational noise impact evaluation for ACP and SHP considers the noise produced by all sound-generating sources associated with the proposed and modified compressor stations that could impact the sound contribution at nearby NSAs. Such sound sources include the turbine-driven compressor units, gas cooling equipment, and aboveground gas piping at each station. Our noise evaluations incorporate noise level reductions from the companies' proposed mitigation measures. Noise controls for the compressor buildings include acoustical specifications for wall, roof, and entry door materials; prohibition of windows or skylights; and acoustical specifications for the ventilation system.

Atlantic and DETI would implement noise mitigation measures for the proposed and modified compressor stations. These measures include, but are not limited to:

- exhaust silencers;
- air intake cleaner/silencers and air intake duct acoustic insulation;
- noise attenuating materials for wall, roof, and doors of compressor buildings;
- lubrication oil cooler maximum noise level of 50 dBA at 50 feet;
- ventilation air inlet and discharge mufflers;
- acoustical insulation for aboveground piping; and
- unit blowdown silencers (60 dBA at 50 feet);

Table 4.11.2-4 shows the estimated noise impact at the nearest NSAs due to the full load operation of Atlantic's new compressor stations.

As demonstrated in table 4.11.2-4, the noise associated with ACP compressor stations would be below the FERC guideline. Noise level increases at NSAs near Compressor Station 1 would range from 0.4 dBA to 8.5 dBA; 0.5 dBA to 2.9 dBA at Compressor Station 2; and 2.3 dBA to 8.0 dBA at Compressor Station 3. The estimated noise increase at most NSAs would be below 3 dBA, which is the threshold of perception for the human ear.

To ensure that noise levels due to operation of the proposed compressor stations would not be significant, **we recommend that:**

- **Atlantic should file a noise survey with the Secretary no later than 60 days after placing each of the ACP compressor stations in service. If a full load condition noise survey is not possible, Atlantic should instead file an interim survey at the maximum possible horsepower load and file the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at any station under interim or full horsepower load exceeds 55 dBA, L_{dn} at any nearby NSA, Atlantic should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Atlantic should confirm compliance with the 55 dBA L_{dn} requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

TABLE 4.11.2-4

Estimated Noise Levels for the Proposed Atlantic Coast Pipeline Compressor Stations

Nearest NSA (Residences)	Distance and Direction from Compressor Station (feet)	Existing Ambient Sound Level (dBA, L_{dn})	Estimated Compressor Station Operational Noise[a] (dBA, L_{dn})	Station Noise + Existing Ambient (dBA, L_{dn})	Noise Increase (dBA)
Compressor Station 1 (Marts)[b]					
S1	3,600 (NNW)	40.5	31.4	41.0	0.5
S2	3,000 (NNW)	44.4	34.4	39.2	1.7
S3	1,800 (N)	39.6	40.4	43.0	3.4
S4	2,000 (NNE)	40.7	38.4	42.7	2.0
S5	2,300 (ENE)	43.2	37.4	44.2	1.0
S6	1,900 (E)	41.1	39.4	43.3	2.2
S7	1,900 (ESE)	50.0	39.4	50.4	0.4
S8	1,000 (SSE)	38.6	46.4	47.1	8.5
S9	2,800 (SSW)	38.7	35.4	40.4	1.7
S10	2,900 (SW)	37.9	35.4	39.9	2.0
Compressor Station 2 (Buckingham)[c]					
S1	2,700 (WNW)	45.9	37.4	46.4	0.5
S2	1,800 (WNW)	46.0	42.4	47.6	1.6
S3	1,450 (WNW)	44.6	44.4	47.5	2.9
S4	1,900 (NNW)	43.2	42.4	45.8	2.6
S5	3,600 (ENE)	41.2	35.4	42.2	1.0
S6	3,000 (ESE)	46.1	38.4	46.8	0.7
S7	3,100 (ESE)	42.7	37.4	43.9	1.2
S8	2,000 (SE)	43.4	42.4	45.9	2.5
S9	2,100 (SE)	43.4	41.4	45.5	2.1
Compressor Station 3 (Northampton)					
S1	850 (NNW)	38.2	45.4	46.2	8.0
S2	1,700 (NE)	38.9	37.4	41.2	2.3

[a] Estimated compressor station operational noise includes mitigation.
[b] Noise estimates include measuring station.
[c] Noise estimates include M&R Station.

Table 4.11.2-5 shows the estimated noise impact at the nearest NSAs due to the full load operation of DETI's modified JB Tonkin Compressor Station.

The noise attributable solely to the proposed modifications at the JB Tonkin Compressor Station would be below the FERC guideline at each NSA. In addition, any noise increase would be below 3 dBA at each NSA. NSAs S10, S11, S12, and S14 would experience total noise levels above the FERC guideline after the proposed modifications; however, these NSAs would experience an overall *decrease* in noise ranging from 1.1 dBA to 3.9 dBA.

TABLE 4.11.2-5

Estimated Noise Levels for the JB Tonkin Compressor Station Modifications

Closest NSAs (Residences)	Distance and Direction from the Compressor Addition (feet)	Sound Level Contribution of Existing Station (dBA, L_{dn})	Baseline Noise with Mitigation Installed on Existing Station Components[a] (dBA, L_{dn})	Estimated Noise Level from Station Modifications (dBA, L_{dn})	Estimated Total Station Noise After Proposed Modifications[b] (dBA, L_{dn})	Change in Ambient Noise Level (dBA)
S2	1,300 (NW)	44.4	44.4	38.4	45.4	1.0
S3	1,400 (NNE)	42.7	41.7	37.4	43.1	0.4
S4	1,200 (NNE)	46.1	45.1	39.4	46.1	0.0
S5	1,300 (NE)	45.0	44.0	38.4	45.1	0.1
S6	1,100 (NE)	51.4	49.4	40.4	49.9	(1.5)
S7	1,000 (ENE)	48.4	46.4	41.4	47.6	(0.8)
S8	1,500 (ENE)	43.8	41.8	37.4	43.1	(0.7)
S9	1,300 (E)	47.9	45.9	38.4	46.6	(1.3)
S10	650 (E)	60.0	57.0	46.4	**57.4**	(2.6)
S11	600 (E)	68.5	64.5	47.4	**64.6**	(3.9)
S12	650 (ESE)	57.2	55.2	46.4	**55.7**	(1.5)
S13	1,000 (SE)	49.3	48.3	41.4	49.1	(0.2)
S14	450 (SE)	58.9	56.9	48.4	**57.5**	(1.4)
S15	1,400 (S)	45.2	43.2	37.4	44.2	(1.0)
S16	2,100 (WSW)	38.5	38.5	33.4	39.7	1.2
S17	1,700 (W)	39.6	39.6	36.4	41.3	1.7

[a] Existing station mitigation would include insulating aboveground piping and enclosing regulator valve actuators.

[b] Noise estimates include a gas measuring station at the compressor station site and proposed mitigation measures. Estimated total station noise after proposed modifications that would exceed the FERC level of 55 dBA L_{dn} are shown in **bold**.

To ensure that the actual noise levels resulting from operation of the JB Tonkin Compressor Station would not be significant, **we recommend that:**

- **DETI should file a noise survey with the Secretary no later than 60 days after placing the JB Tonkin Compressor Station in service. If a full load condition noise survey of the entire station is not possible, DETI should instead file an interim survey at the maximum possible horsepower load and file the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at the JB Tonkin Compressor Station under interim or full horsepower load conditions exceeds existing levels at NSAs S10, S11, S12, and S14 or 55 dBA L_{dn} at any other nearby NSAs, DETI should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. DETI should confirm compliance with the above requirements by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

Tables 4.11.2-6 and 4.11.2-7 show the estimated noise impact at the nearest NSAs due to the full load operation of DETI's modified Crayne and Mockingbird Hill Compressor Stations, respectively.

TABLE 4.11.2-6

Estimated Noise Levels for the Crayne Compressor Station Modifications

Nearest NSAs (Residences)	Distance and Direction to the Compressor Addition (feet)	Sound Level Contribution of Existing Station (dBA, L_{dn})	Estimated Noise Level from Station Modifications (dBA, L_{dn})	Estimated Station Noise Level After Proposed Modifications (dBA, L_{dn})[a]	Noise Increase (dBA)
S1	1,700 (NNW)	46.5	32.4	46.7	0.2
S2	1,450 (N)	43.6	33.4	44.0	0.4
S3	1,100 (NNE)	42.4	36.4	43.4	1.0
S4	900 (NNE)	41.7	38.4	43.4	1.7
S5	800 (NE)	45.4	40.4	46.6	1.2
S6	500 (ENE)	50.6	44.4	51.5	0.9
S8	450 (ESE)	52.3	45.4	53.1	0.8
S9	1,800 (ENE)	50.1	31.4	50.2	0.1
S10	3,100 (SE)	45.2	25.4	45.2	0.0
S11	3,600 (SSE)	42.6	23.4	42.7	0.1
S12	1,900 (SSW)	49.8	31.4	49.9	0.1
S13	2,000 (SSW)	49.3	30.4	49.4	0.1
S14	1,900 (SW)	52.6	31.4	52.6	0.0
S15	2,500 (SW)	46.6	27.4	46.7	0.1
S16	3,200 (W)	38.7	24.4	38.9	0.2

[a] Noise estimates include proposed mitigation measures.

TABLE 4.11.2-7

Estimated Noise Levels for the Mockingbird Hill Compressor Station Modifications

Nearest NSAs (Residences)	Distance and Direction to the Compressor Addition (feet)	Estimated Total Noise Level of Existing Station (dBA, L_{dn})[a]	Estimated Noise Level from Station Modifications (dBA, L_{dn})	Estimated Station Noise Level After Proposed Modifications (dBA, L_{dn})	Noise Increase (dBA)
S1	4,500 (WNW)	49.9	25.4	49.9	0.0
S5	750 (NNW)	49.6	46.4	51.3	1.7
S6	2,600 (SSE)	46.1	33.4	46.3	0.2
S7	2,800 (S)	47.0	32.4	47.1	0.1
S8	2,400 (SSW)	46.2	34.4	46.5	0.3
S9	2,500 (SSW)	43.1	33.4	43.5	0.4
S10	3,000 (SSW)	45.6	31.4	45.8	0.2

[a] This estimate includes noise increases from gas coolers that were installed at the existing station in 2016 as part of the Monroe to Cornwell Project.

[b] Noise estimates include proposed mitigation measures.

As demonstrated in tables 4.11.2-6 and 4.11.2-7, noise levels at the Crayne and Mockingbird Hill Compressor Stations would meet the FERC guidelines at each NSA. In addition, the noise increase at each NSA would be less than 3 dBA and would likely not be perceptible. To ensure that the actual noise levels resulting from operation of the Crayne and Mockingbird Hill Compressor Stations are not significant, **we recommend that:**

- **DETI should file a noise survey with the Secretary no later than 60 days after placing each of the Crayne and Mockingbird Hill Compressor Stations in service. If a full load condition noise survey of the entire station is not possible, DETI should instead file an interim survey at the maximum possible horsepower load and file the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at the Crayne and Mockingbird Hill Compressor Stations under interim or full horsepower load conditions exceeds 55 dBA L_{dn} at any nearby NSAs, DETI should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. DETI should confirm compliance with the 55 dBA L_{dn} requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

We received numerous comments regarding excessive, harmful noise from ACP and SHP compressor stations. Each compressor station associated with the projects would meet the FERC guidelines, except for the JB Tonkin Compressor Station in Westmoreland County, Pennsylvania, where the noise level currently exceeds FERC guidelines at four NSAs. However, at these locations, DETI estimates that the station noise would be reduced from current levels. In addition, the noise increases for all stations range from 0 to 8.5 dBA, with most NSAs experiencing increases near or below 3 dBA, which is the threshold of perception for the human ear. As such, we find that noise levels attributable to ACP and SHP compressor stations at the nearest NSAs would not be significant.

We received comments stating that ACP and SHP compressor stations would cause vibrations, specifically Compressor Station 2 (Buckingham County, Virginia). FERC regulations require that no perceptible increase in vibration may occur as a result of compressor station operation. The proposed compressor units at all compressor stations, including Compressor Station 2, would be combustion turbines. As such, we do not expect there to be an issue with vibration, as it is more characteristic of reciprocating engines. Through FERC's dispute resolution service helpline, we are aware that induced vibration, or a low frequency sound from compressor stations, has occurred at a limited number of natural gas facilities in the over 300,000 miles of transmission pipeline in the United States. However, we are unaware of wide-scale cases of low frequency noise from natural gas transmission facilities. With hundreds of thousands of residents near natural gas pipelines and compressor stations, we have seen no system evidence that natural gas pipelines or compressor stations are inducing noise effects on local residences. This appears to be an isolated issue that continues to be addressed through the dispute resolution service and landowner helpline.

Landowners near the proposed and modified compressor stations expressed concern with the noise levels resulting from compressor station operations and blowdown events. Planned blowdowns occur because of maintenance activities; Atlantic and DETI would incorporate blowdown silencers to minimize noise during planned blowdowns. Projected sound levels associated with planned blowdown events are estimated to be about 31 dBA at 1,000 feet away and would remain below 55 dBA L_{dn} at the nearest NSAs. Planned blowdown events at each compressor station would be infrequent, lasting from 1 to 5 minutes. Specifically, the unit blowdown silencer at each station would be designed to limit blowdown noise to a maximum A-weighted sound level of 60 dBA at 50 feet. Unplanned blowdown events would be very infrequent and would occur in the event of an emergency. The sound levels associated with an unplanned, unsilenced station blowdown would be about 100 dBA at 1,000 feet away. Given the non-routine nature and short-term duration of these blowdown events, we do not believe that they would be a significant contributor to operational noise from the Projects.

Meter Stations

Atlantic's Kincheloe M&R Station and DETI's CNX M&R Station would be within ACP Compressor Station 1, and the Woods Corner M&R Station would be within ACP Compressor Station 2.

The noise levels associated with these M&R Stations are incorporated in the compressor station noise levels shown in table 4.11.2-4 above. It is our experience that M&R stations may vary widely in terms of the equipment used at each station, and the noise levels associated with M&R stations could result in noise impacts at nearby NSAs. In addition, the number of residences in proximity to M&R stations could justify the need for post-construction noise surveys to ensure that the noise attributable to the M&R stations is within acceptable limits. In addition to the Kincheloe and Woods Corner M&R Station, Atlantic would construct seven new M&R stations along the proposed pipelines.

On March 24, 2017, Atlantic filed noise surveys for its proposed M&R stations. The Long Run, Brunswick, Greensville, and Fayetteville M&R Stations do not have residences or other NSAs within 0.5 mile of the proposed sites. The results for the Elizabeth River, Pembroke, and Smithfield M&R Stations are provided in table 4.11.2-8 below. Although estimated M&R total station noise after proposed modifications would exceed the FERC level of 55 dBA Ldn in most cases, the M&R station would not contribute to this increase because the existing ambient noise levels already exceed this level.

TABLE 4.11.2-8

Estimated Noise Levels for the Proposed Atlantic Coast Pipeline M&R Stations

Nearest NSA	Distance and Direction from M&R Station (feet)	Existing Ambient Sound Level (dBA, L_{dn})	Estimated M&R Station Operational Noise[a] (dBA, L_{dn})	M&R Station Noise + Existing Ambient (dBA, L_{dn})	Noise Increase (dBA)
Elizabeth River M&R Station					
S1	1,450 (NE)	57.7	27.4	57.7	0.0
S2	1,750 (NE)	58.8	25.4	58.8	0.0
S3	1,650 (ESE)	60.7	25.4	60.7	0.0
S4	1,650 (SE)	58.0	25.4	58.0	0.0
S5	1,750 (SE)	54.9	25.4	54.9	0.0
S6	1,800 (SSE)	55.9	24.4	55.9	0.0
S7	2,450 (S)	54.4	21.1	54.4	0.0
S8	2,500 (SSW)	56.2	21.4	56.2	0.0
S9	2,150 (SW)	59.9	234	59.9	0.0
Pembroke M&R Station					
S1	1,200 (NE)	53.0	32.4	53.0	0.0
S2	800 (E)	49.7	36.4	49.9	0.2
S3	1,600 (SE)	49.6	29.4	49.6	0.0
S4	1,200 (SSE)	59.7	32.4	59.7	0.0
S5	1,250 (SSW)	61.5	32.4	61.5	0.0
S6	2,200 (W)	57.6	26.4	57.6	0.0
S7	2,150 (NW)	44.6	26.4	44.7	0.1
S8	1,600 (NNE)	60.8	29.4	60.8	0.0
Smithfield M&R Station					
S1	2,450 (NNW)	62.2	19.4	62.2	0.0
S2	1,250 (NNW)	56.7	26.4	56.7	0.0
S3	1,900 (S)	52.6	22.4	52.6	0.0
S4	1,700 (SW)	51.5	23.4	51.5	0.0
S5	2,600 (NW)	64.1	18.4	64.1	0.0

Note: Noise results are provided for M&R stations that contain NSAs within 0.5 mile.

Based on the analyses conducted, mitigation measures proposed, and our additional recommendations, we conclude that the projects would not result in significant noise impacts on residents, and the surrounding communities.

4.11.3 Air Quality and Noise on Federal Lands

4.11.3.1 Air Quality

Construction of ACP would have air quality impacts on the MNF and GWNF, as well as at the ANST and BRP. No compressor stations would be constructed on NFS lands or along the BRP; therefore, impacts on air quality would be limited to pipeline construction. The two entry sites for the ANST/BRP HDD would be about 0.4 and 0.5 mile away from the ANST and BRP, respectively. Construction air quality impacts would be limited primarily to the immediate construction area and would have a minimal impact on hikers and backpackers along the ANST. Emissions resulting from vehicle travel (construction equipment and on-road vehicles) would result in temporary impacts on the area and would subside once construction is complete. Similar to construction impacts discussed in section 4.11.1.3, fugitive dust and construction and commuter vehicle emissions would occur during typical pipeline construction. Atlantic would implement measures in its *Fugitive Dust Control and Mitigation Plan* (see table 2.3.1-1) to minimize construction air quality impacts. Fugitive dust would be localized and once construction is complete, related emissions would subside and air quality would return to preconstruction conditions. Operational emissions would be limited to fugitive pipeline methane leaks from valves and fittings. Pipeline leaks should not impede or impact use of the BRP or ANST. We conclude that construction and operation of ACP would not have a significant impact on air in the MNF and GWNF and along the ANST and BRP.

4.11.3.2 Noise

Construction of ACP would result in temporary noise increases along the pipeline right-of-way. Activities such as HDD, clearing, and trenching would impact local noise in the immediate vicinity of the workspace; however, the noise would dissipate with increased distance from the construction area. The BRP/ANST HDD would result in a noise increase near the entry and exit sites during construction. Noise impacts on hikers and trail users would occur throughout HDD construction activities; however, based on the distance of the trail from the entry and exit sites (about 0.4 and 0.5 mile, respectively), the noise levels experienced would be minimal. Increased traffic from commuter vehicles, trucks, and construction equipment would contribute to noise near the ANST and BRP, although we do not anticipate that this noise would be significant. Typical pipeline construction at any given location could take several months (through to restoration) and would occur during daylight hours. However, once construction is complete, noise would return to preconstruction levels. There would be no noise impacts due to operation of the pipeline. Noise impacts on wildlife are discussed in section 4.5.8 of this EIS. While HDD activities would occur on a 24-hour basis, based on the estimated HDD noise levels provided in table 4.11.2-3 and our HDD monitoring recommendation above, we conclude that there would be no significant impact on noise levels in the MNF and GWNF and along the ANST and BRP.

5.1.9 Socioeconomics

Construction of ACP and SHP would not have a significant adverse impact on local populations, housing, employment, or the provision of community services. There would be temporary increases in housing such as hotels, motels, and other rental units due to the influx of construction workers, and temporary increase in demand for local public services, such as police to direct traffic during construction, or to respond to emergencies associated with pipeline construction. Also, traffic levels would temporarily increase due to the commuting of the construction workforce to the area of the project as well as the movement of construction vehicles and delivery of equipment and materials to the construction right-of-way.

We received comments regarding the potential for negative effects on natural resources and the environment from construction and operation of ACP and SHP to negatively affect tourism, particularly in

the Rockfish Valley Wintergreen areas in Nelson County, Virginia, Yogaville in Buckingham County, Virginia, and Pocahontas County, West Virginia. Scenic travelers and tourists in each state crossed by the projects would experience temporary visual and noise impacts associated with construction personnel and equipment and vegetation removal associated with construction workspaces. Atlantic would coordinate with Rockfish Valley and Wintergreen area businesses and recreational stewards to inform them of construction schedules and traffic volumes and would, to the extent practicable, schedule construction activities to avoid conflicts with special events. Yogaville is over 4 miles from the proposed Compressor Station 2, and the Light of the Truth Universal Shrine at Yogaville is 1 mile from the proposed ACP route alignment and over 1 mile from the nearest proposed HDD location. We conclude that the project locations are sufficiently distant from the Yogaville properties so that people enjoying the peaceful and serene environment would not be disturbed by project construction or operation. Therefore, we conclude no direct or indirect impacts on tourism and visitation to Yogaville would result from construction and operation of the projects.

We received several comments on the draft EIS regarding traffic impacts on existing narrow, single-lane, unpaved roads that have been identified by Atlantic as access roads for use during construction in areas of West Virginia and Virginia. Commenters are concerned that added construction traffic (e.g., worker trips and large equipment and material delivery) would cause dangerous conditions and extensive damage. We acknowledge there may be temporary construction impacts on residences and businesses along these more narrow, rural access roads. Impacts may include inconveniences caused by noise and dust, disruption to access of home and businesses, and traffic congestion, and damage to the roadways themselves. Atlantic and DETI would prepare spread-specific traffic and transportation management plans for managing vehicle traffic during construction of the projects to mitigate and minimize impacts. In addition, Atlantic and DETI would repair any damages to roadway surfaces as required in the FERC *Plan*.

We received comments regarding the potential effect of ACP and SHP on property values. We assessed available studies regarding property values and based on the research reviewed, we find no conclusive evidence indicating that natural gas pipeline easements or compressor stations would have a significant negative impact on property values, although this is not to say that any one property may or may not experience an impact on property value for either the short or long term. One compressor station study concluded that "well designed and operated compressor stations located on larger sites with adequate buffers should have minimal impact on surround land uses and residential property values." Also, the effect that a pipeline easement may have on property value is a damage-related issue that would be negotiated between the parties during the easement acquisition process.

We received comments on the draft EIS from several local business owners concerned that construction of ACP and SHP would negatively impact their businesses and may, in some instances force them to close. We acknowledge that businesses may be directly and indirectly impacted by the projects; however, overall construction of ACP and SHP would benefit state and local economies by creating a short-term stimulus to the affected areas through payroll expenditures, local purchases of consumables and project-specific materials, and sales tax. The long-term socioeconomic effect of the projects during operation is also likely to be beneficial, based on the increase in tax revenues that would accrue in the affected communities and jurisdictions; however, these benefits would not be as significant as during construction.

We also received comments that the project would delay or potentially prevent two large projects from being developed in the Rockfish Valley area: a luxury hotel at Wintergreen Resort and the Spruce Creek Resort and Market, a proposed five-star destination resort, hotel, restaurant, and public market. Based on information provided by Wintergreen Property Owners Association Inc. and Wintergreen Resort Inc., the proposed hotel would be located over 1 mile east of the project. According to developers, the proposed development is estimated to produce $15 million to $20 million in annual revenue. Based on

information provided by the developer, the AP-1 mainline would cross the Spruce Creek Resort and Market in Nelson County, Virginia. Specifically, the developer is concerned that the project would cross the middle of the property, eliminating the attractiveness of the resort area and, thus, development of the resort would be stopped. We believe that construction of ACP and development of the hotel at Wintergreen Resort and the development of Spruce Creek Resort and Market could be accomplished such that impacts associated with ACP are reduced or mitigated for, while maintaining the appeal of the area, as demonstrated by other residential and commercial developments in the area and similar projects throughout the country.

We received numerous comments on the draft EIS expressing concern about minority and low-income communities near the proposed Compressor Station 2 in Buckingham County, Virginia. We determined that Compressor Station 2 would be within a census tract that is designated a low-income environmental justice population. The two other census tracts within 1 mile of the proposed Compressor Station 2 are also designated low-income environmental justice populations. None of the three census tracts within 1 mile of the proposed Compressor Station 2 are designated minority environmental justice populations. The nearest residence to the proposed Compressor Station 2 is approximately 1,450 feet from the site.

Due to the number of comments we received regarding environmental justice, and specifically impacts resulting from increased air and noise emissions at the proposed Compressor Station 2, we have expanded our discussion of the potential for the risk of impacts to fall disproportionately on environmental justice communities.

Air pollutants associated with ACP and SHP include increased dust as a result of construction equipment and vehicles, and compressor station emissions, which include carbon monoxide (CO), carbon dioxide (CO_2), methane, and nitrous oxide (NO_x); volatile organic compounds (VOCs); and particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$). These air pollutants are known to increase the effects of asthma[1] and may increase the risk of lung cancer. When considering the health impacts associated with compressor station emissions, increased rates of lung cancer were identified associated with the compounds emitted by compressor station operations (Nafstad et al., 2003). Studies have shown that several different cancer-related compounds and chemicals are present in the air in proximity to construction and operation of compressor stations, and that some of these have documented health effects on the general and vulnerable populations (Southwest Pennsylvania Environmental Health Project, 2015).

Due to high rates of asthma within the African American community, we consider this community especially sensitive. Thus, it is reasonable to assume that, where African American populations exceed the thresholds for environmental justice populations identified in this analysis, those populations have an increased risk over Caucasian populations (and therefore disproportionate) of experiencing adverse effects from decreased air quality. Further, it is recognized that low income populations have greater risks associated with negative health outcomes (CDC, 2017).

Due to construction dust and compressor station emissions, African American populations near ACP and SHP could experience disproportionate impacts due to their susceptibility to asthma. Impacts from construction dust would be minor as they would be temporary and localized. Further, Atlantic and DETI would implement measures from their *Fugitive Dust Control and Mitigation Plan* to limit fugitive

[1] Asthma is a chronic disorder impacting the lung airways where periods of reversible airflow obstruction is experienced. Individuals experience asthma "episodes" or "attacks" from a variety of events including exercise, airway infections, airborne allergens, occupational exposures, and air pollutions such as particulate matter and volatile organic compounds. Asthma is incurable but controllable though appropriate medical care with medication and avoiding exposures to triggers for attacks (CDC, 2013).

dust emissions. Impacts from compressor station emissions would be moderate because, while they would be permanent facilities, air emissions would not exceed regulatory permittable levels. As a result, no disproportionately high and adverse impacts on environmental justice populations as a result of air quality impacts, including impacts associated with the proposed Compressor Station 2, would be expected as a result of ACP and SHP. Also, no disproportionately high and adverse impacts on environmental justice populations as a result of other resources impacts would be expected.

Based on the analysis presented, we conclude that ACP and SHP would not have a significant adverse impact on the socioeconomic conditions of the project area.

5.1.10 Cultural Resources

Atlantic and DETI conducted archival research and field surveys to identify historic resources and locations for additional subsurface testing in areas with potential for prehistoric and historic archaeological sites. Atlantic has completed cultural resources surveys of approximately 94.5 percent of the proposed project facilities, leaving or 5.5 percent of the project workspace remaining to be surveyed due to landowner access denials. DETI has surveyed 99 percent of the APE for SHP facilities.

To date, Atlantic identified 198 archaeological and historic sites within the APE for ACP that are listed in the NRHP, eligible for listing, are unevaluated, or would otherwise require treatment during construction (e.g., cemetery avoidance plans for cemeteries that are not eligible for listing). SHPO concurrence with these recommendations are pending on most of these sites. Atlantic would avoid impacts on eligible or unevaluated cultural sites by project design, or would conduct additional studies to further assess NRHP eligibility. On the MNF, Atlantic located one previously recorded archaeological site within the APE and recorded five new sites, all of which are recommended as not eligible for listing on the NRHP. Atlantic conducted additional surveys on the MNF in 2017 and would provide a report documenting the results of the surveys to the MNF when they are complete. On the GWNF, Atlantic recorded 11 sites, including 7 prehistoric archaeological sites, 3 historic sites, and 1 site with both prehistoric and historic components. Eligibility determinations and treatment recommendations are ongoing and pending FS comments on Atlantic's cultural resources survey reports. In addition, Atlantic has not yet provided survey results of recently identified topsoil segregation ATWS on NFS lands.

To date, DETI identified two cultural resources sites that are recommended as eligible and would be avoided or mitigated during construction; one historic farmstead that is recommended as eligible, but would not be affected by SHP; and three historic cemeteries that are recommended not eligible, but would be avoided during construction.

ACP would cross the NRHP-eligible BRP for 0.1 mile at the border between Augusta and Nelson Counties, Virginia. No cultural sites were identified during surveys and Atlantic would install the pipeline beneath the BRP using the HDD method or direct pipe method; therefore, Atlantic recommends that there would be no direct effects on the BRP. The NPS commented that they were satisfied with the report's findings.

We received numerous comments about possible project impacts on several historic districts, including the Warminster Rural Historic District located in Nelson County, Virginia and determined eligible for listing on the NRHP in 2015; the South Rockfish Rural Historic District, also in Nelson County, Virginia and determined eligible for NRHP listing by the VDHR; and the Sunray Agricultural Historic District located within the City of Chesapeake, Virginia and listed on the NRHP in 2007. The pipeline corridor would cross 2.25 miles of the Warminster Historic District and the midsection of the South Rockfish Rural Historic District and may affect individual properties that are eligible or listed in the NRHP. The project would cross the Sunray Agricultural Historic District at one location, a proposed access road

that traverses historic site 131-5325-0063. Atlantic has committed to assess potential effects of ACP on the historic districts, consult with the VDHR as needed, and make recommendations for further evaluation or mitigation of adverse effects.

We received numerous comments regarding possible historic burials or cemeteries within the APE in West Virginia and Virginia. Atlantic would be required to complete surveys and evaluate the significance of cultural sites within the APE prior to construction. Atlantic has committed to avoiding effects on cemeteries and burials. Atlantic would conduct additional pedestrian reconnaissance using pedestrian survey, and probing using metal rods to identify any additional burials outside the known cemetery boundaries. Atlantic would avoid cemeteries and burials with an appropriate buffer during construction, and would file treatment plans identifying methods (e.g., fencing, vegetation buffers) to avoid impacts on cemeteries during construction.

We, as well as Atlantic and DETI, consulted with 15 federally recognized Native American tribes to provide them an opportunity to comment on ACP and SHP. Several tribes and organizations requested additional information, and we have responded to tribes that commented on the project. Atlantic and DETI have prepared plans to be used in the event any unanticipated archaeological sites or human remains are encountered during construction. The plans provide for work stoppage and the notification of interested parties, including Indian tribes, in the event of discovery.

To date, archaeological and historic architectural surveys have not yet been completed for the ACP and SHP routes. To ensure that our responsibilities under section 106 of the NHPA are met, we are recommending that Atlantic and DETI not begin construction until any additional required surveys are completed; that survey reports, special studies, evaluation reports and treatment plans have been reviewed by the appropriate parties; and we provide written notification to proceed. In addition, we are recommending that Atlantic file revised *Unanticipated Discovery Plans* that include tribal contact information for those tribes that request to be notified following post-review discovery of archaeological sites, and documentation of communication with the Lumbee Nation, the Coharie Tribal Council, Haliwa-Saponi Tribe, and the Meherrin Tribe. The studies and impact avoidance, minimization, and measures proposed by Atlantic and DETI, and our review and recommendations, would ensure that historic properties are identified, evaluated, and any adverse effects appropriately mitigated.

5.1.11 Air Quality

Air quality impacts associated with construction of ACP and SHP would include emissions from fossil-fueled construction equipment, blowdown and purging activities, open burning, and fugitive dust from earth/roadway surface disturbance. These impacts would generally be temporary and localized, and would not be expected to cause or contribute to a violation of applicable air quality standards; however, to further minimize construction emissions, Atlantic and DETI could implement measures such as enforcing idling time limits, utilizing clean diesel through add-on technologies, and using newer equipment.

Open burning would potentially occur along sections of the AP-1 mainline and TL-635 pipeline loop, which effects would be minimized by implementing Atlantic's and DETI's *Timber Removal Plan, Fire Plan*, and *Open Burning Plan.* Based on the mitigation measures outlined in Atlantic and DETI's *Fugitive Dust Control and Mitigation Plan* and the temporary nature of construction, we conclude that construction of ACP and SHP would not have a significant impact on air quality. Following construction at the compressor stations, emissions would transition to operating emissions.

Operation of ACP and SHP would generate emissions of nitrogen oxides, carbon monoxide, and particulate matter, sulfur dioxide, volatile organic compounds, GHGs, and hazardous air pollutants. ACP's proposed new Compressor Stations 1, 2, and 3 would be subject to a PSD major source threshold of 250

tpy. Potential operational emissions from the Crayne and J.B. Tonkin Compressor Stations after proposed modifications would remain below PSD major source thresholds; therefore, these stations would not be subject to PSD regulations. While emissions from the Mockingbird Hill Compressor Station would be minor, the net emissions increase of PM, PM_{10}, $PM_{2.5}$, and GHGs would still exceed the major modification thresholds, representing a significant net emissions increase and required BACT analysis. The Mockingbird Hill and JB Tonkin Compressor Stations are currently subject to Title V regulations and would remain Title V facilities after construction. The Crayne Compressor Station, authorized under a State operating permit, is a minor source under Title V and would remain so after construction of SHP.

The Mockingbird Hill Compressor Station is approximately 70 miles (about 113 kilometers) northeast of the Otter Creek Wilderness Class I area and 80 miles (about 129 kilometers) northeast of the Dolly Sods Wilderness Class I area, both of which are managed by the FS. Because the Mockingbird Hill Compressor Station is more than 100 kilometers from these Class I areas an assessment of the impact on these Class I areas is not required. However, the WVDEP may be responsible for notifying the federal land manager and determining any needed additional analysis, as part of the PSD permitting process.

The emissions that would occur in nonattainment or maintenance areas would not exceed the general conformity applicability thresholds for any criteria pollutant in a single calendar year. Therefore, general conformity would not apply to ACP and SHP.